

VOL. XXXIV. No. 2

FEBRUARY 1949

MECCANO

MAGAZINE



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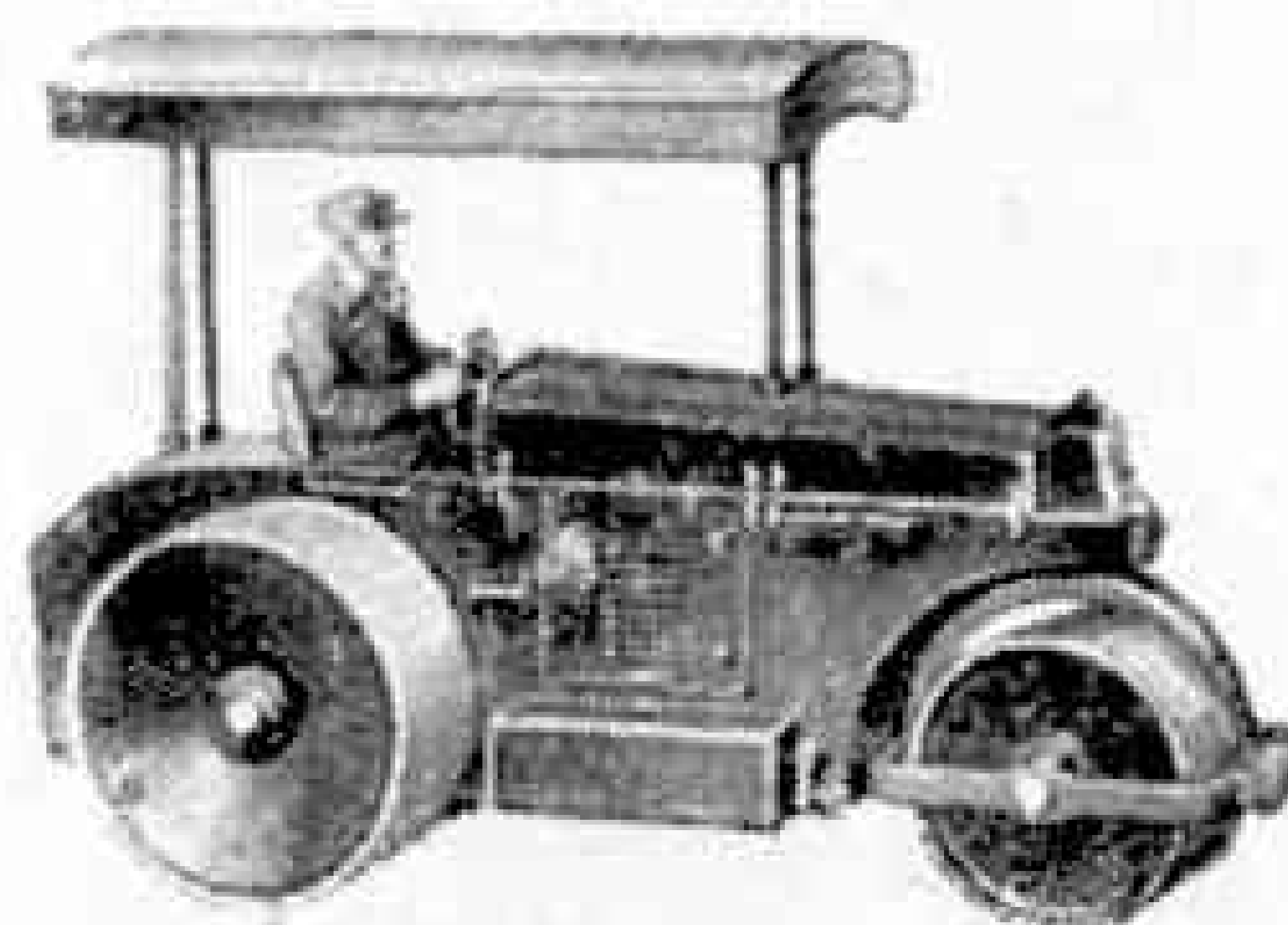
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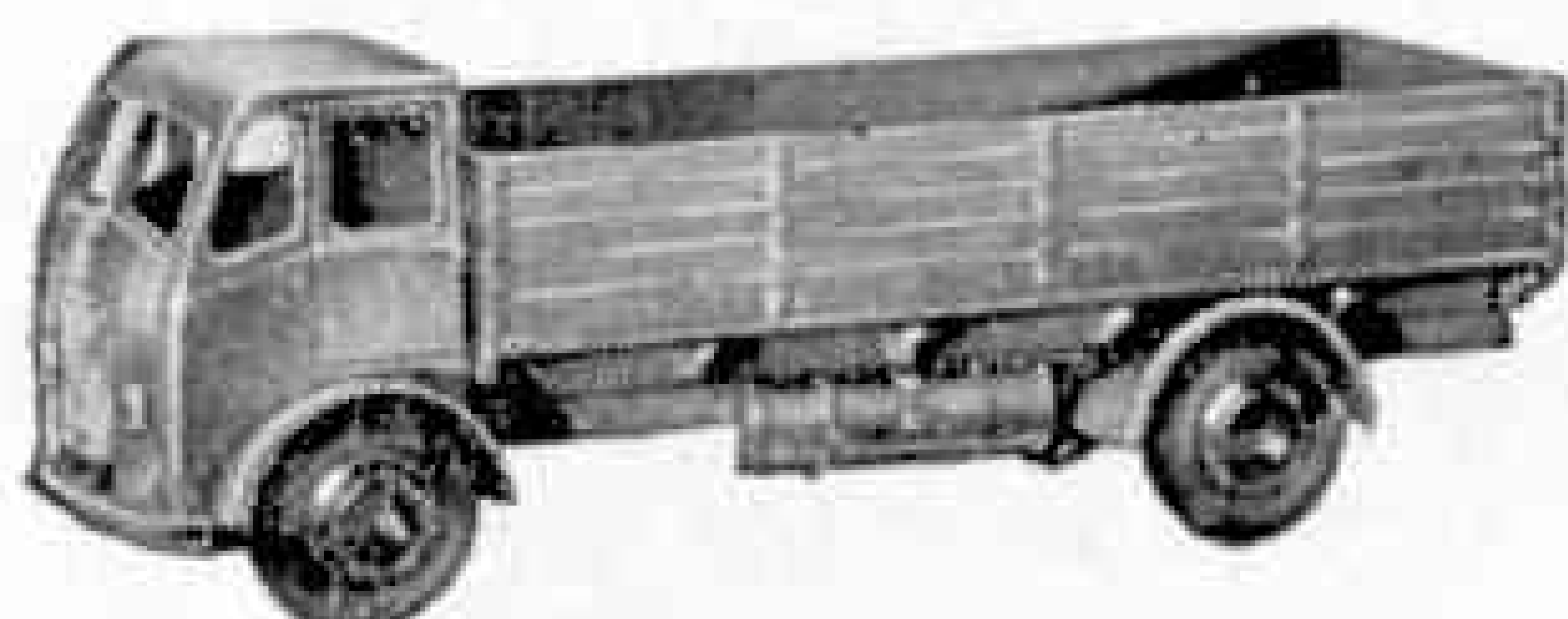
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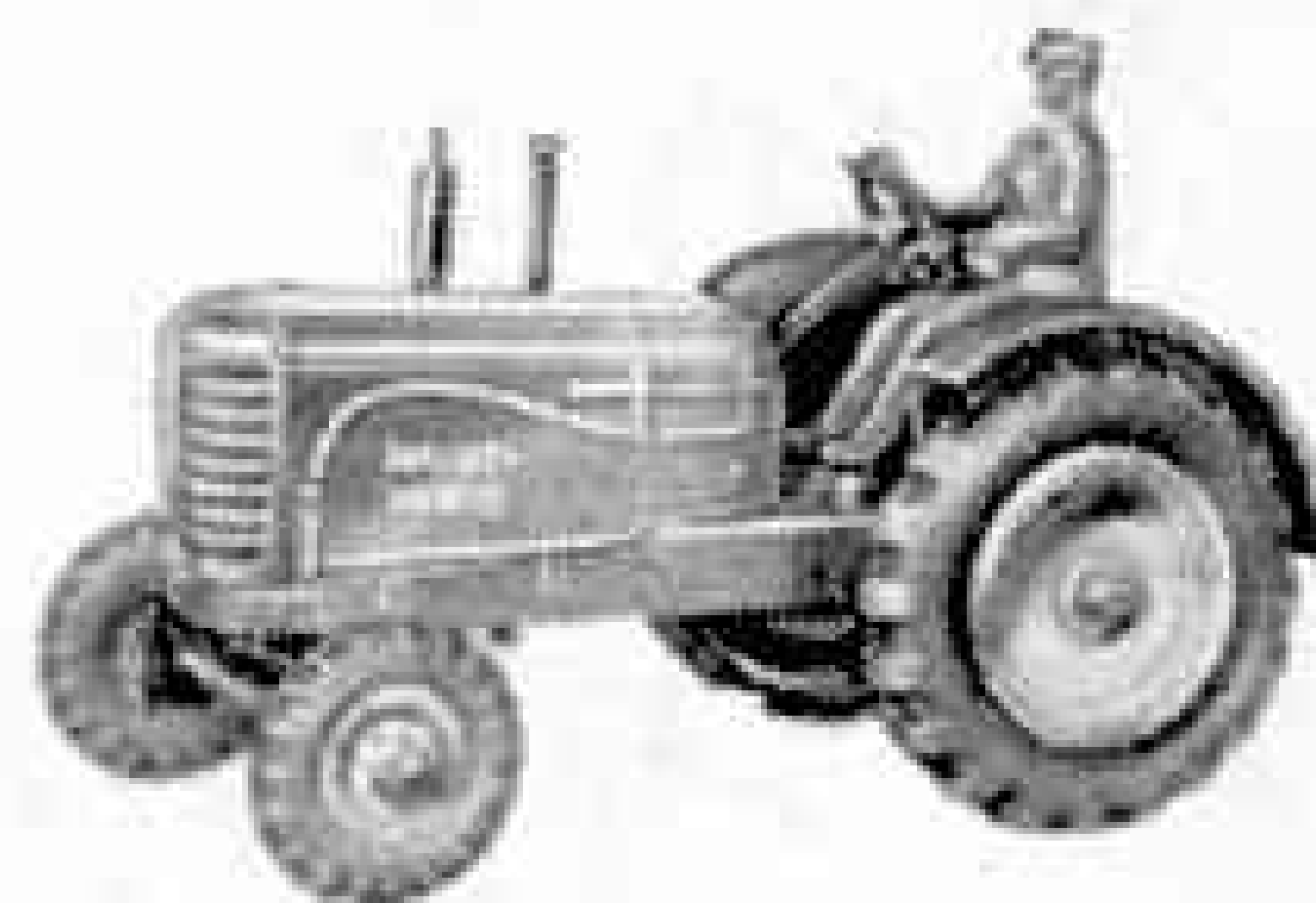


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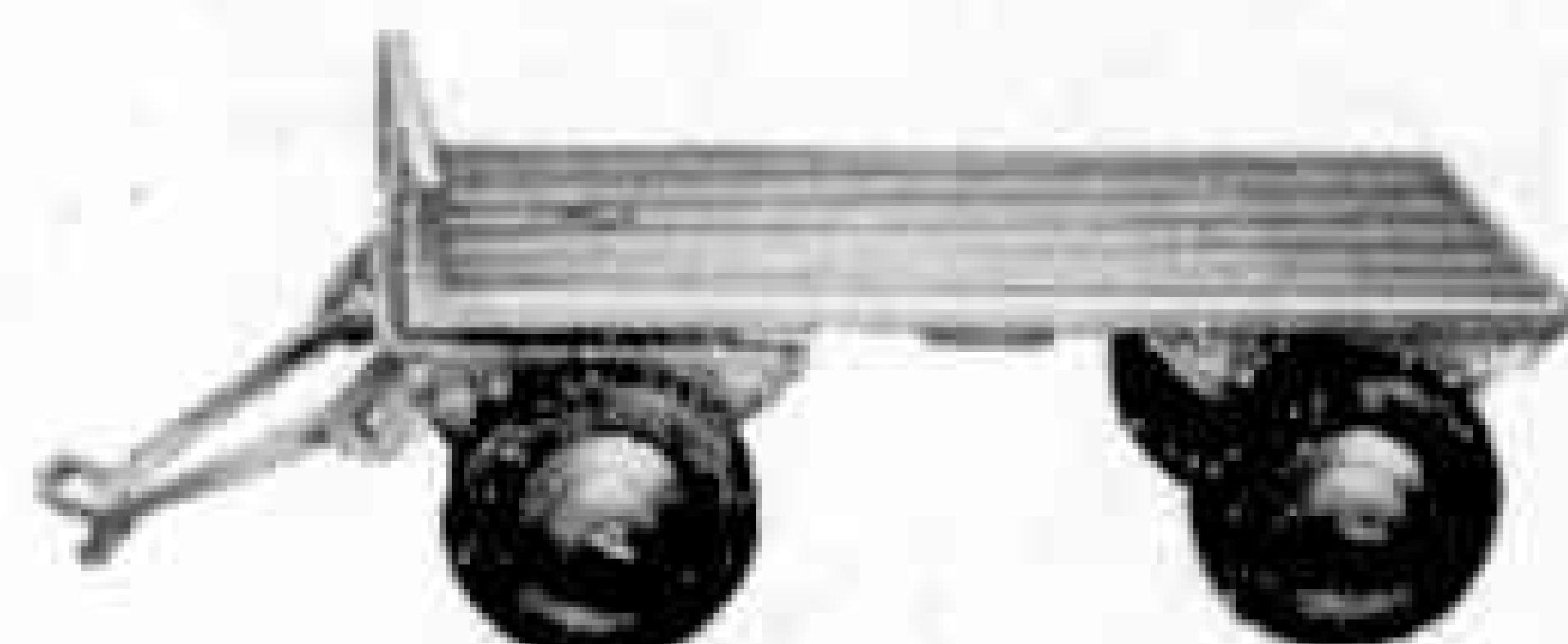
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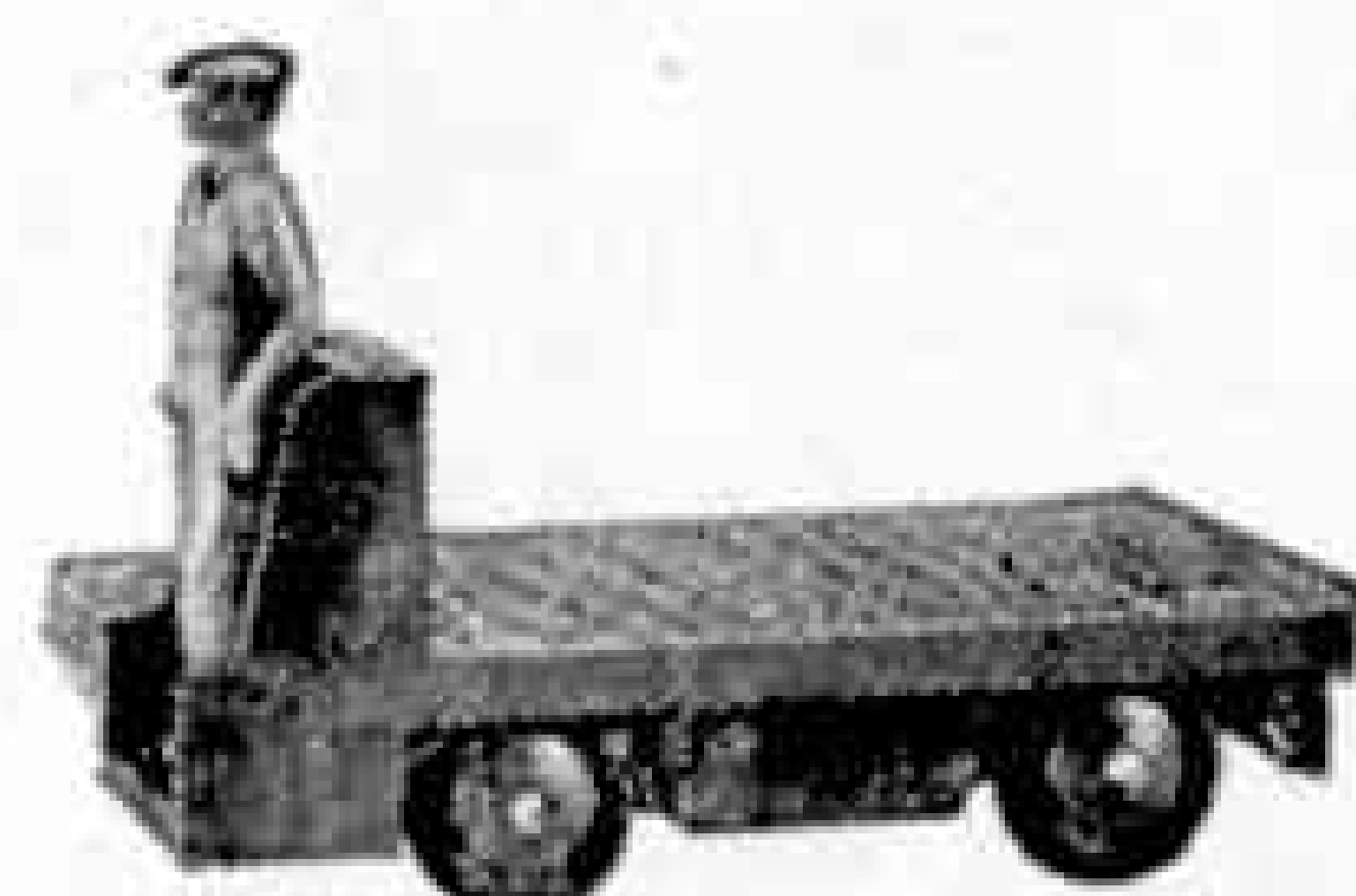
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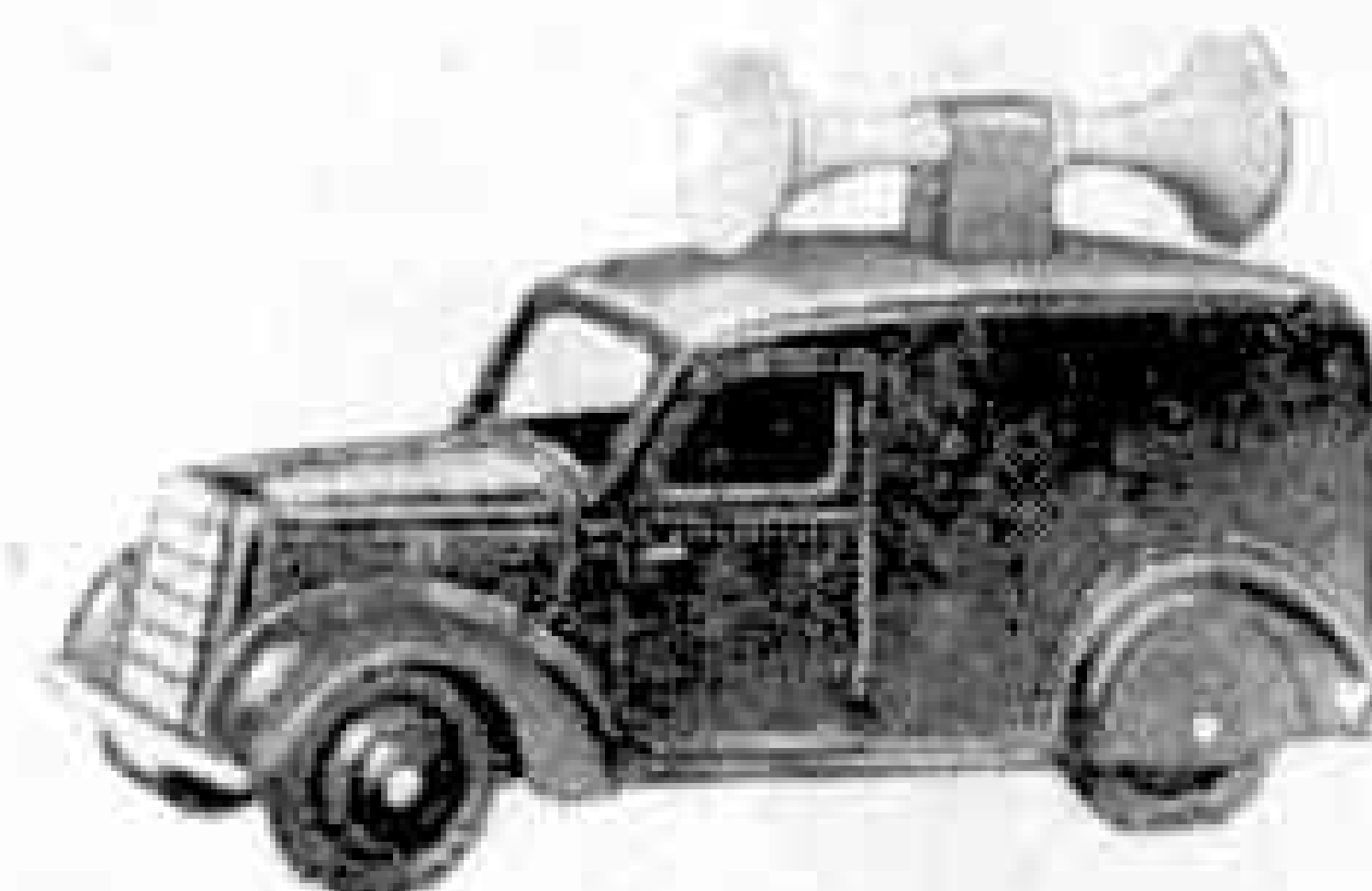
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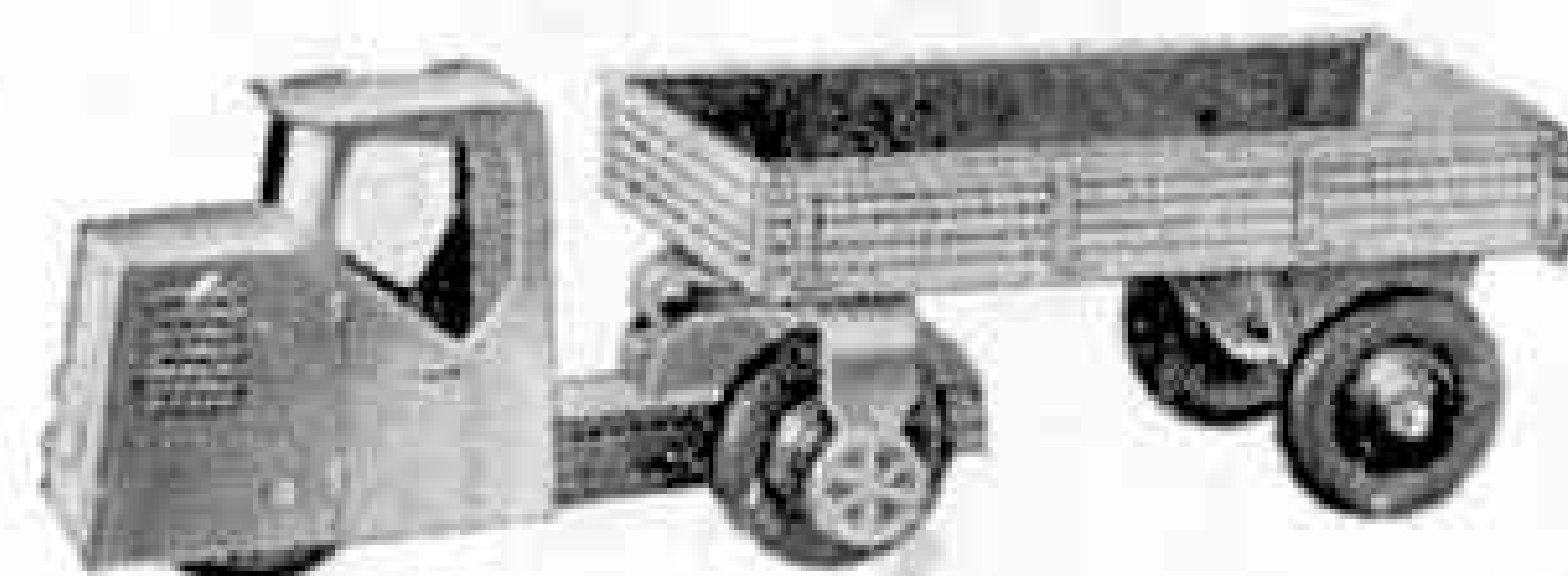
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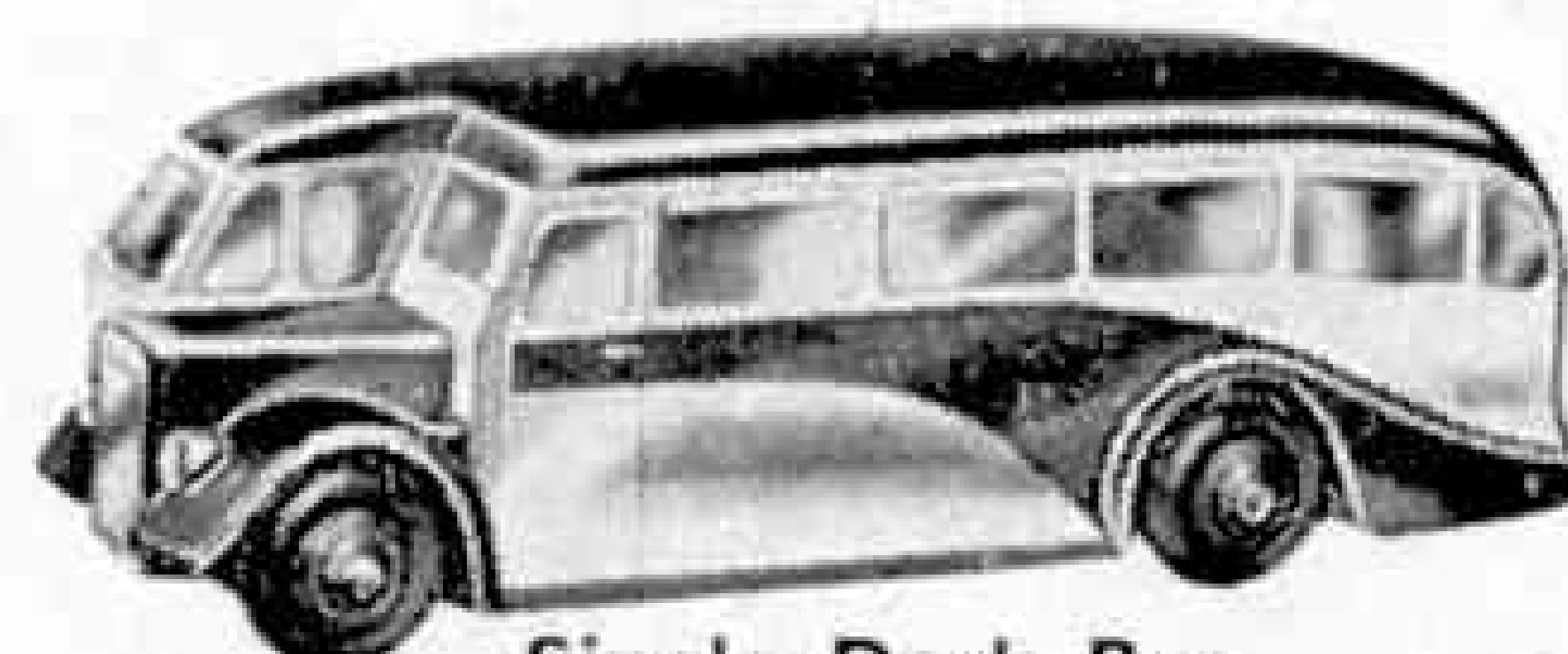
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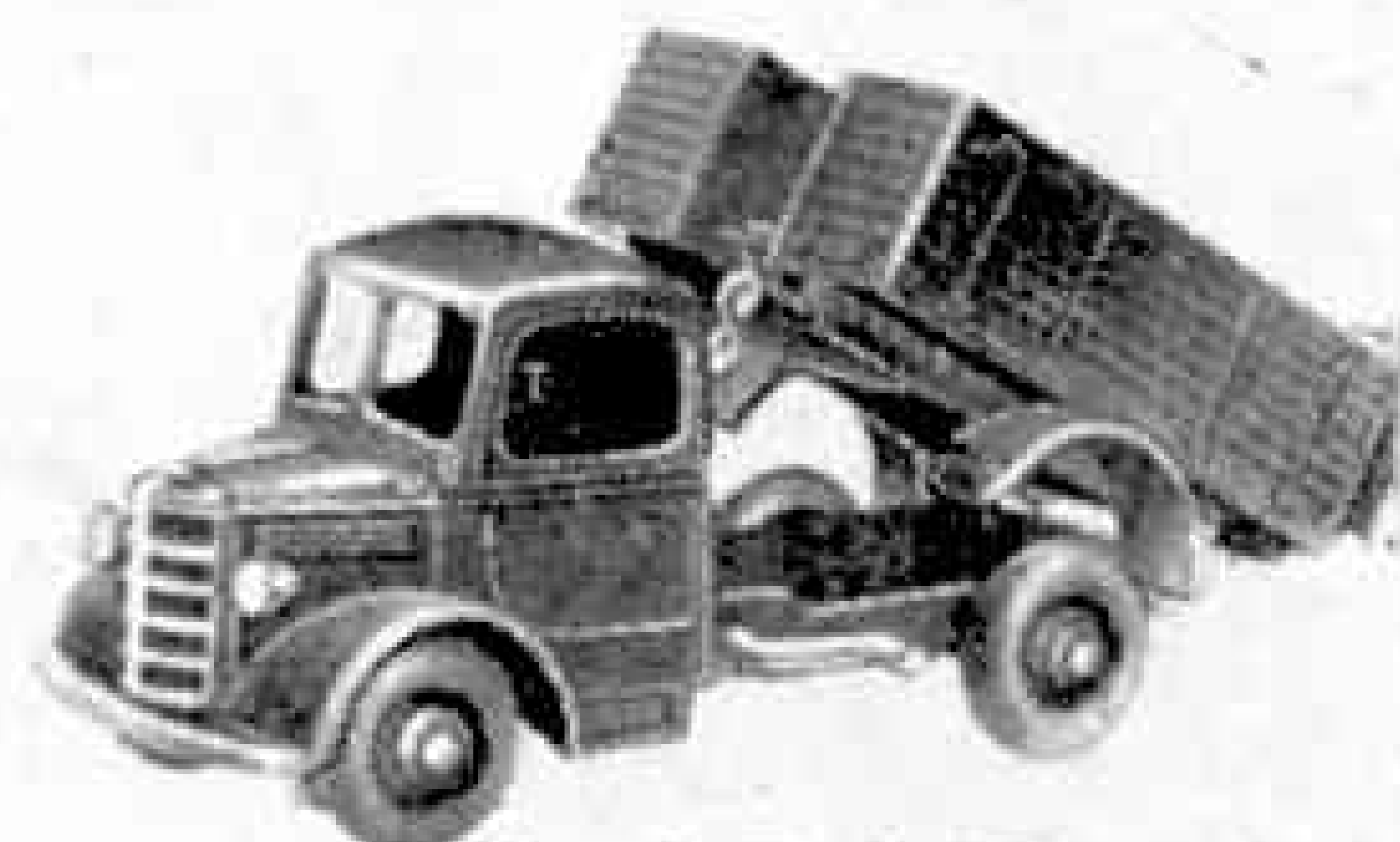
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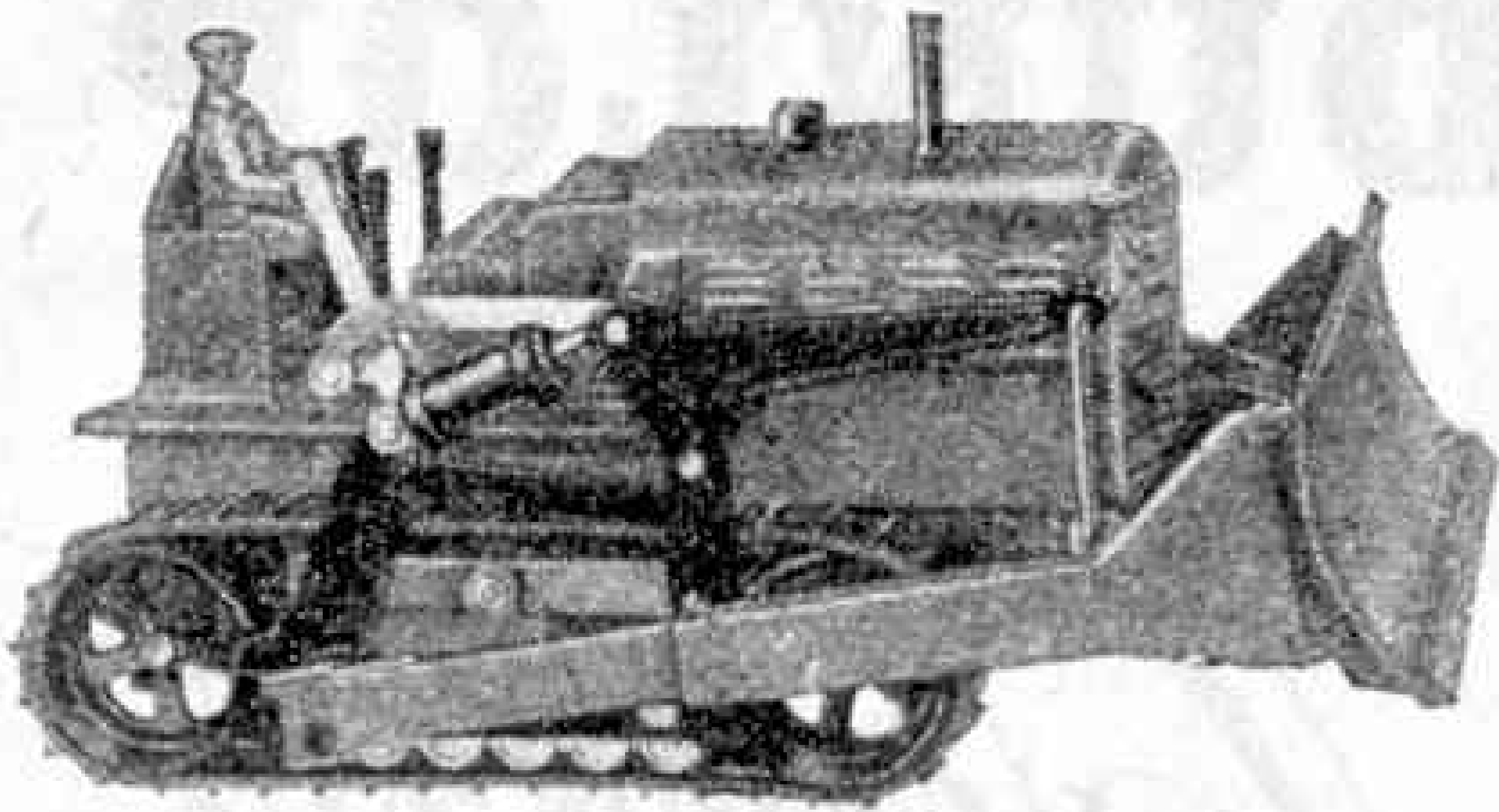


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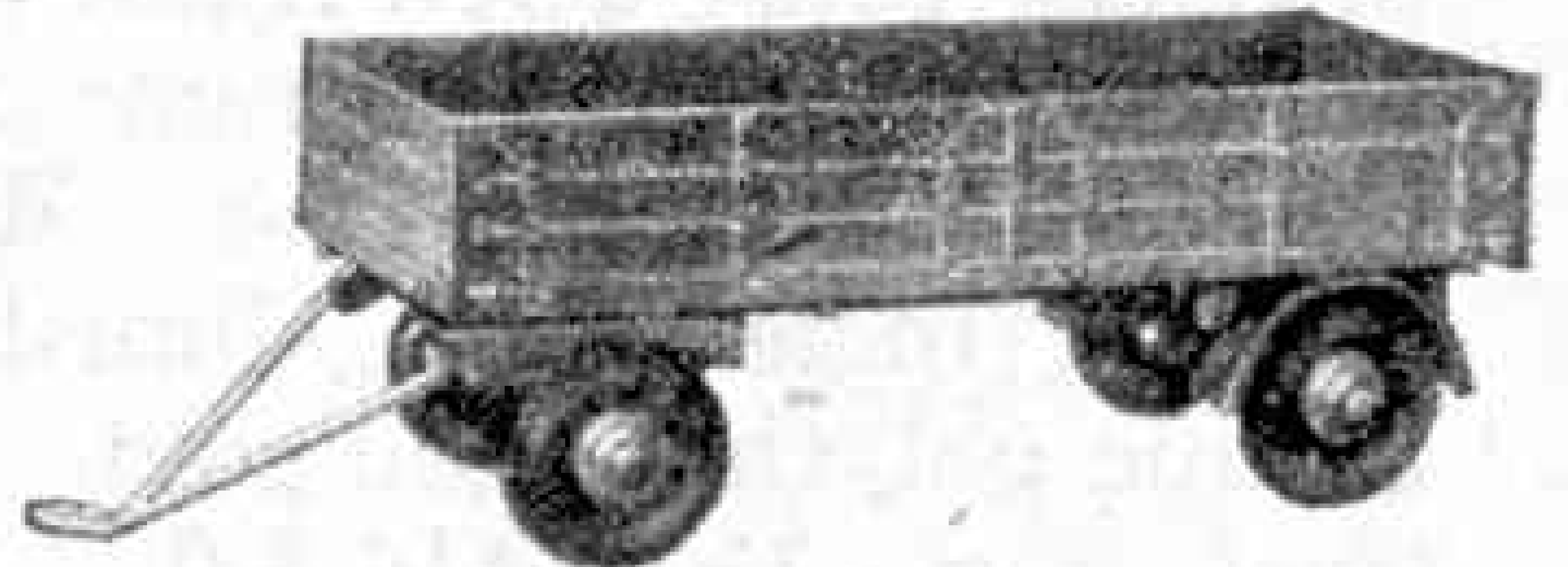
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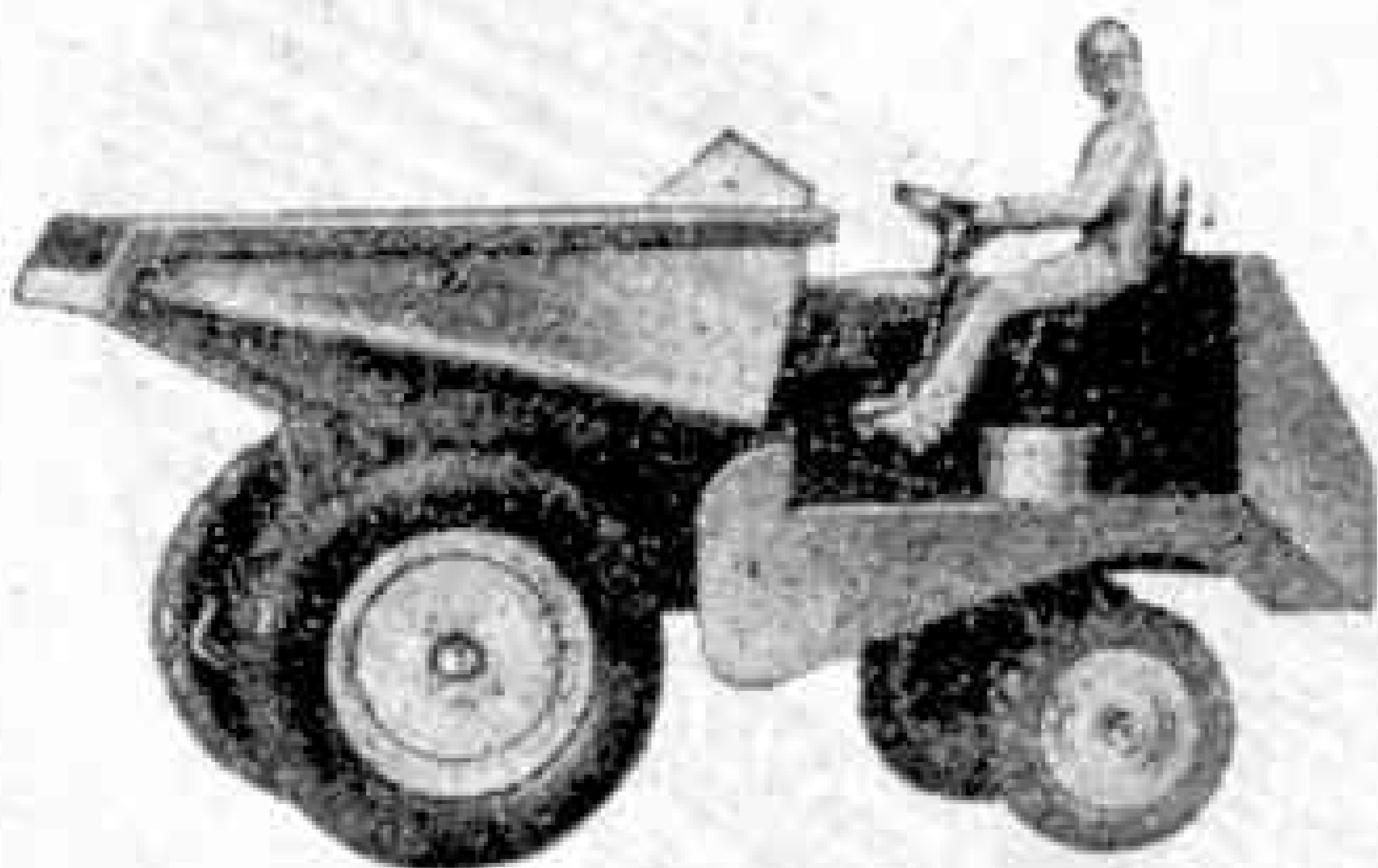
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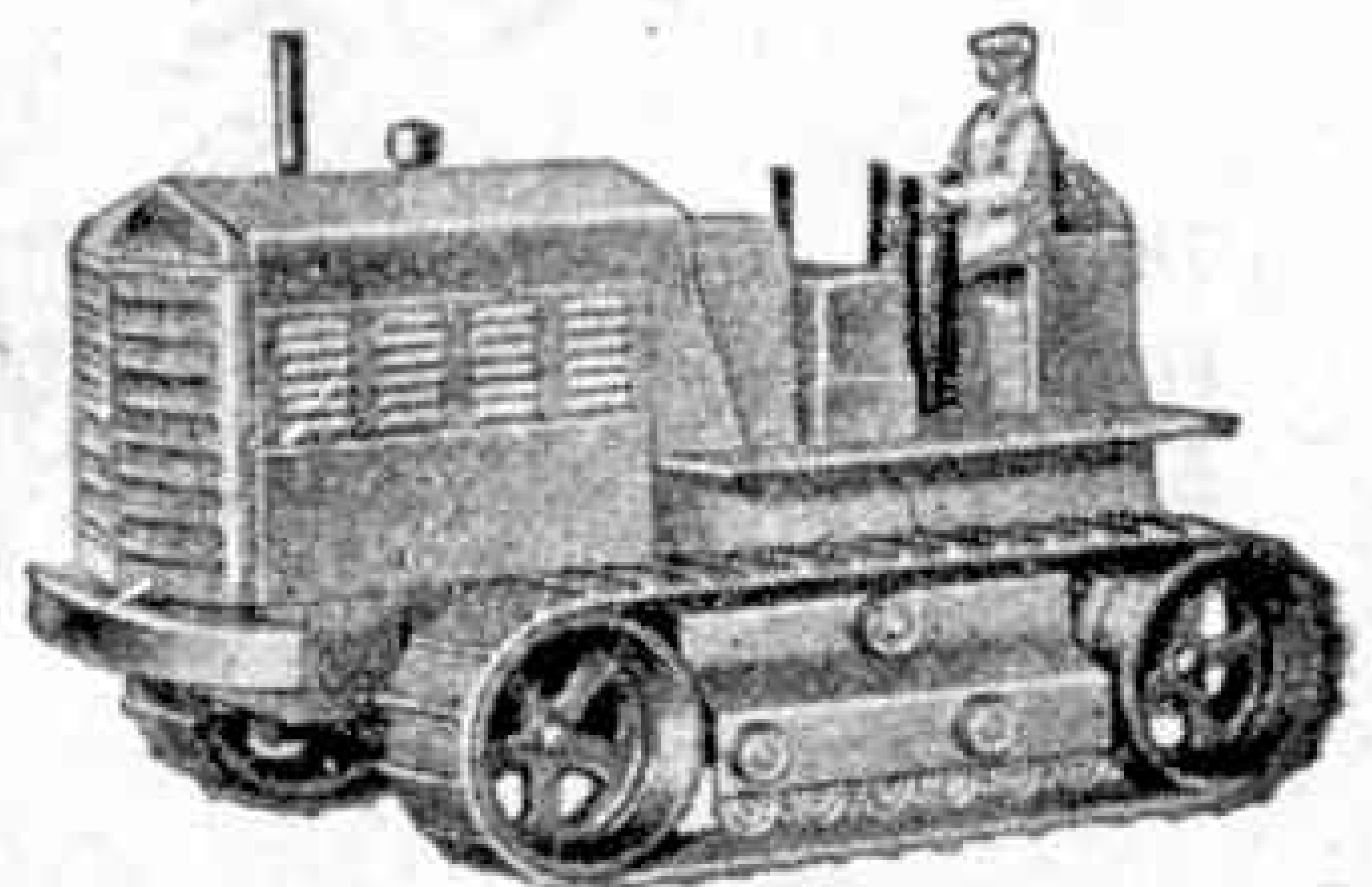
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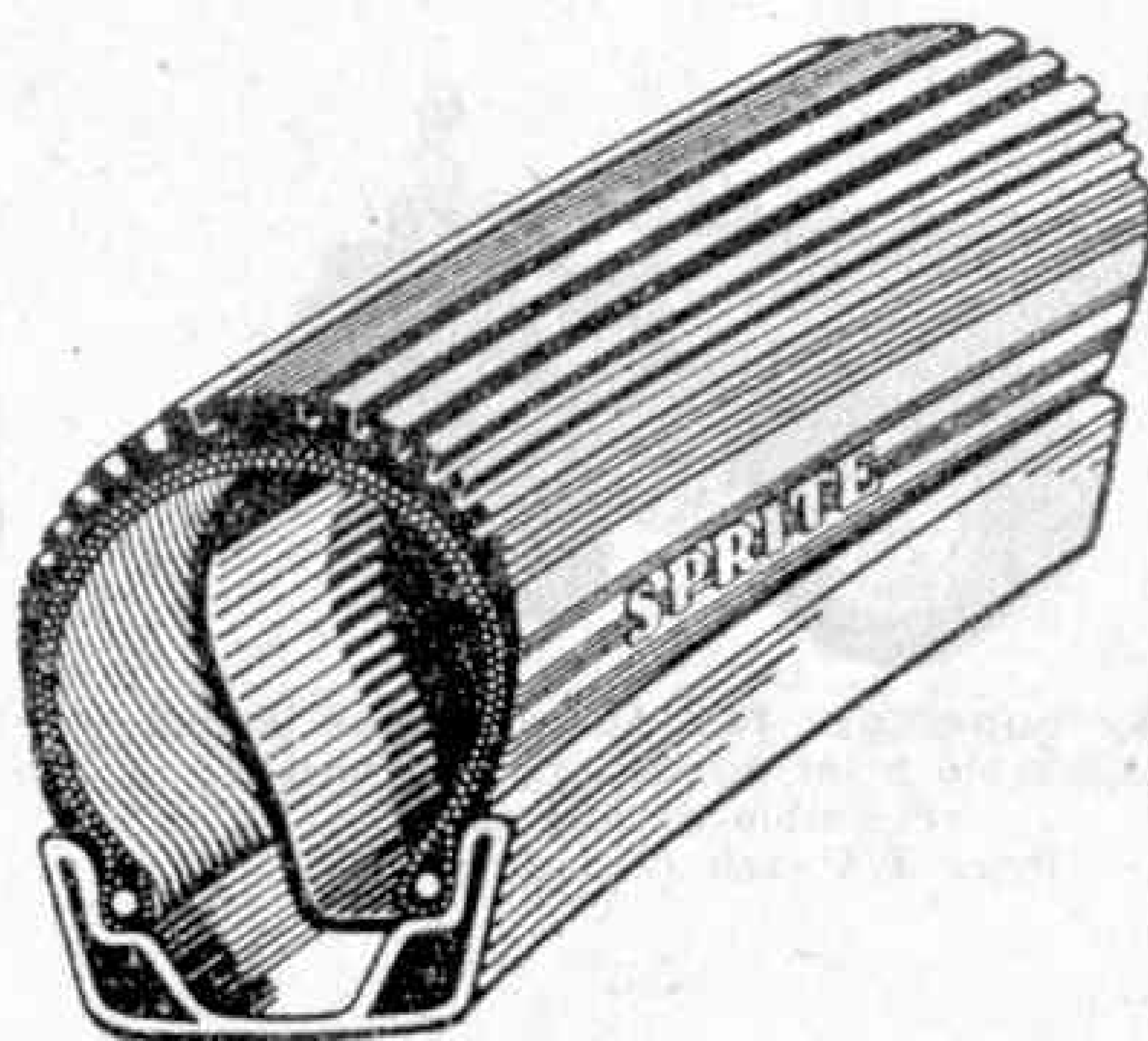


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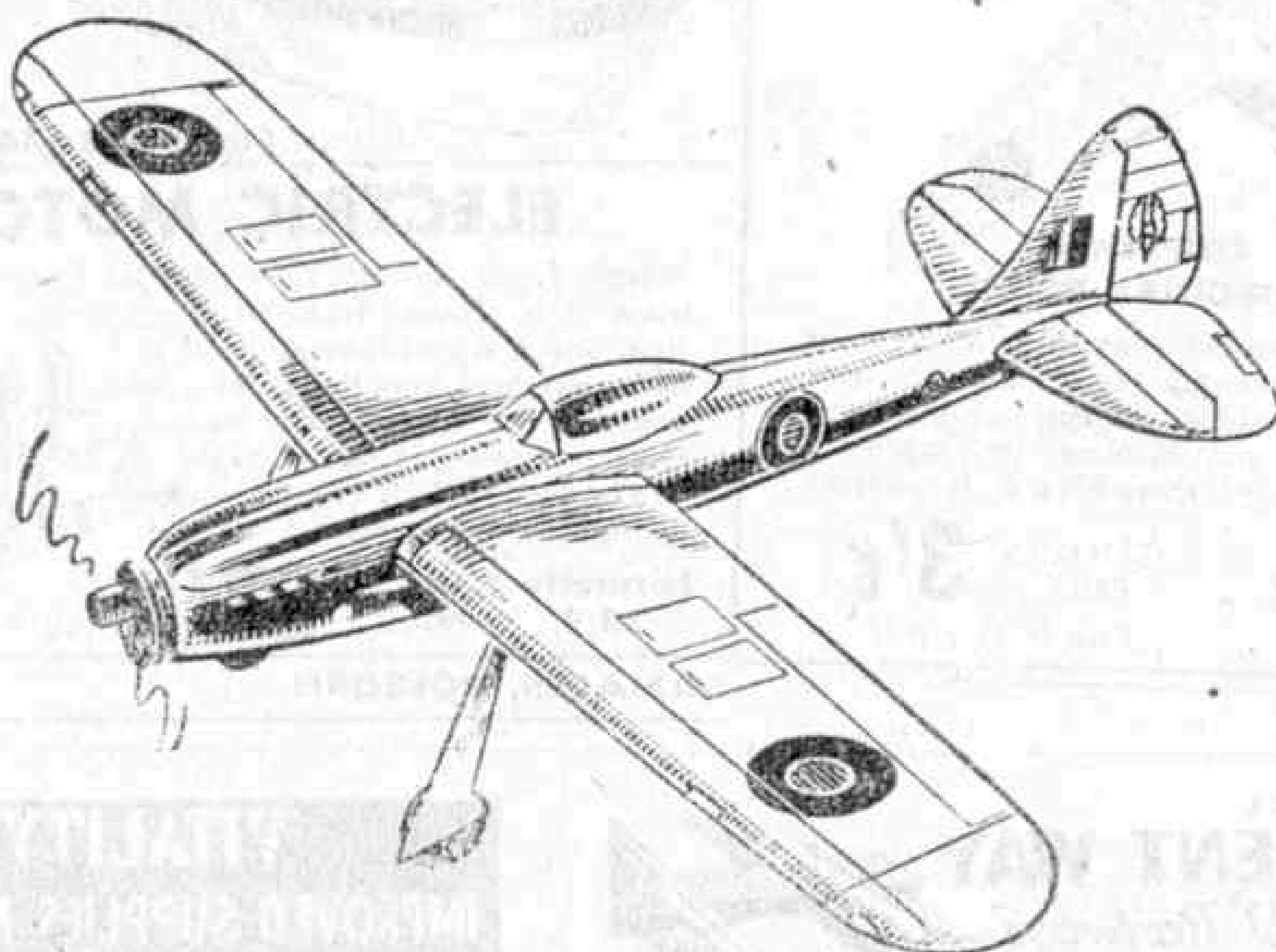
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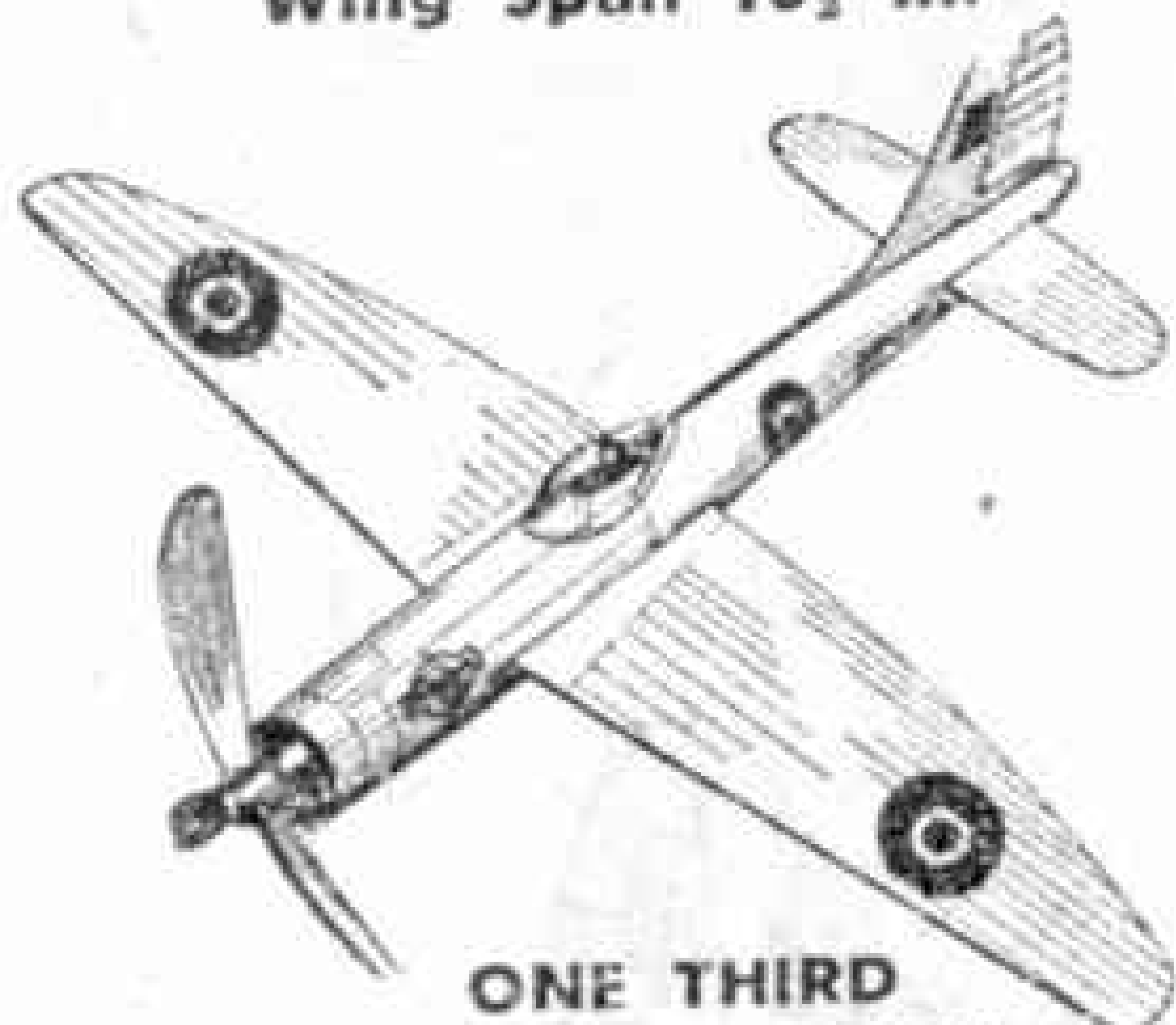
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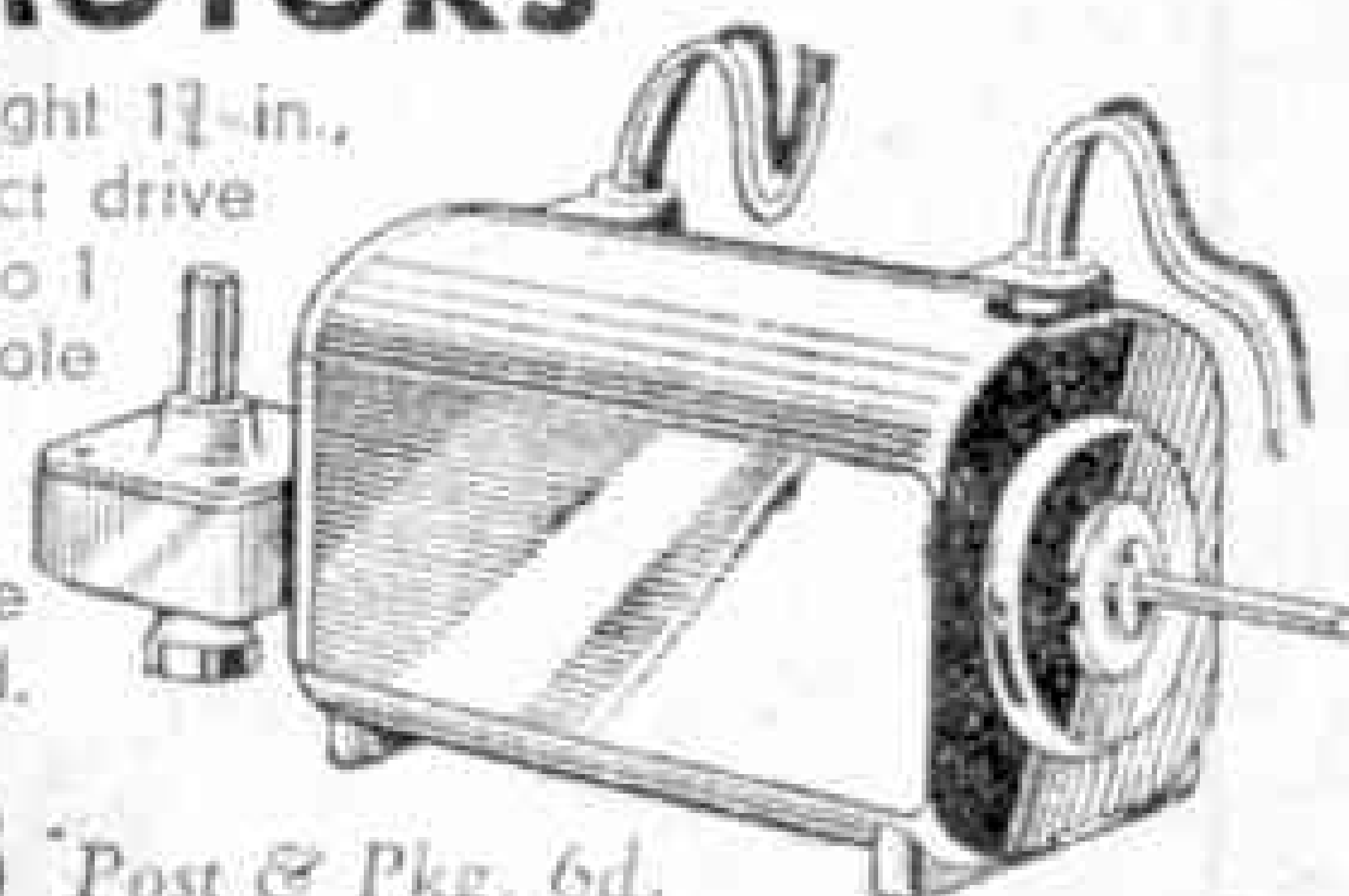
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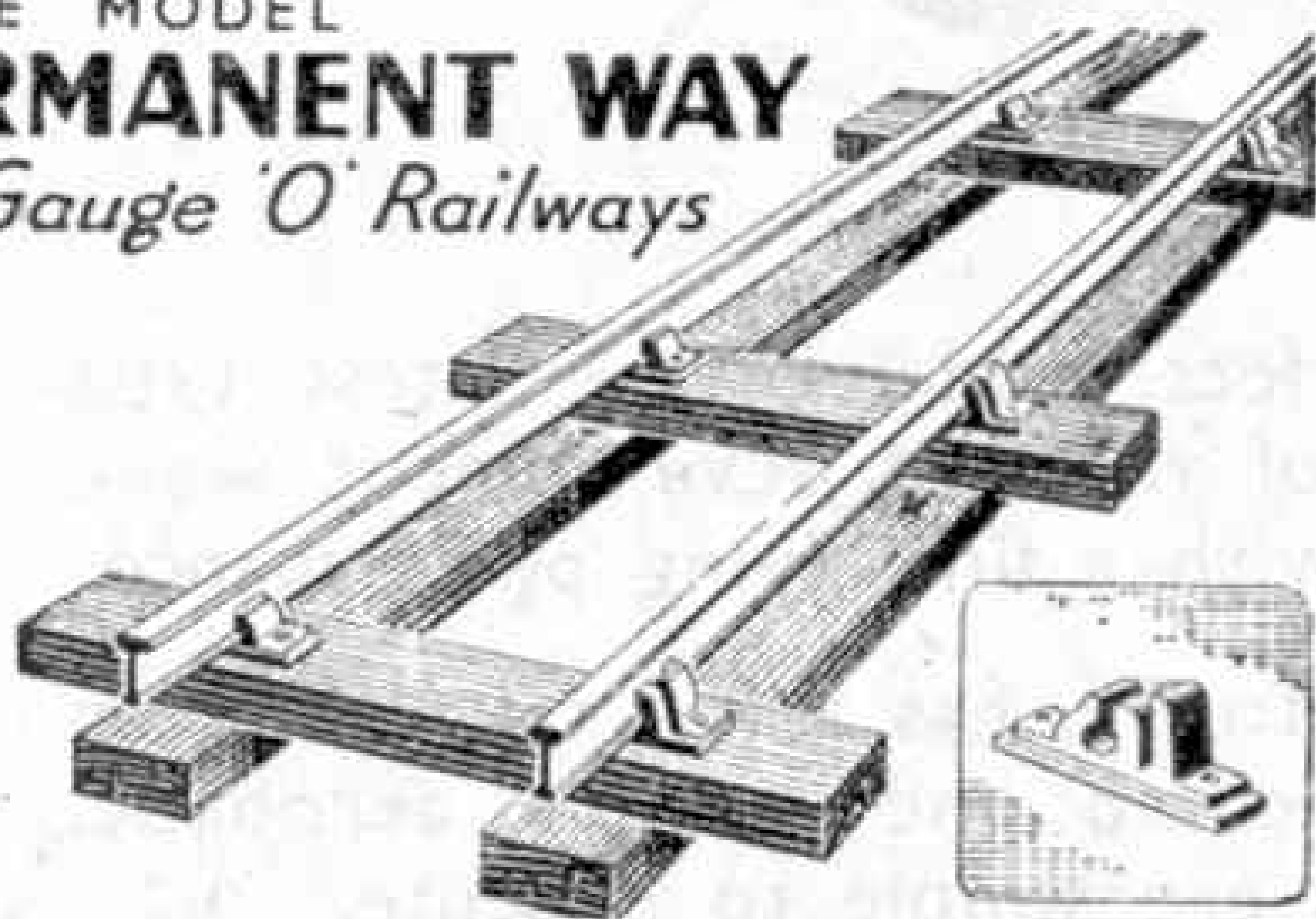
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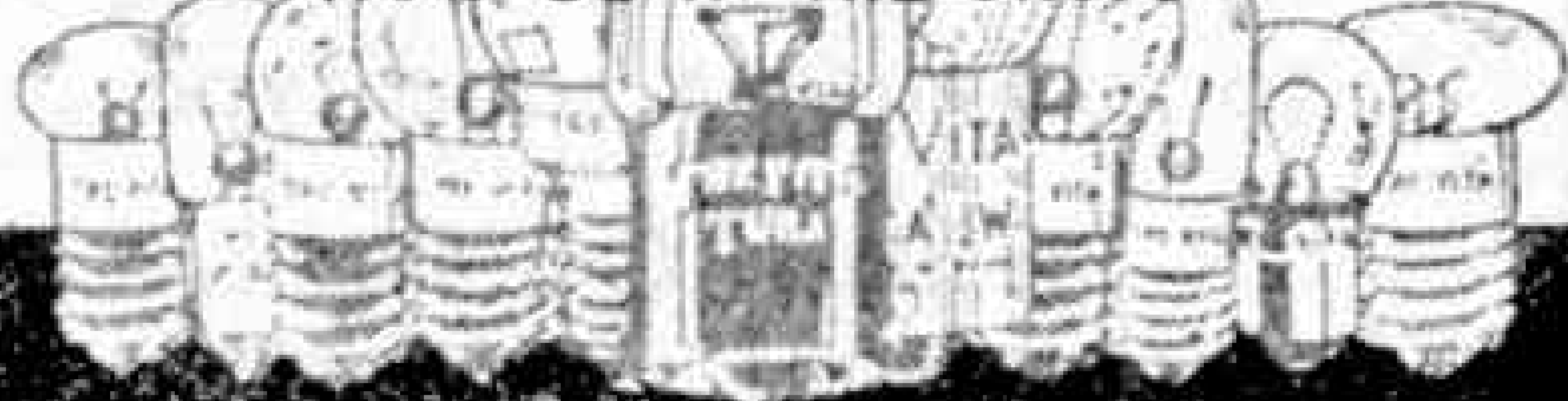


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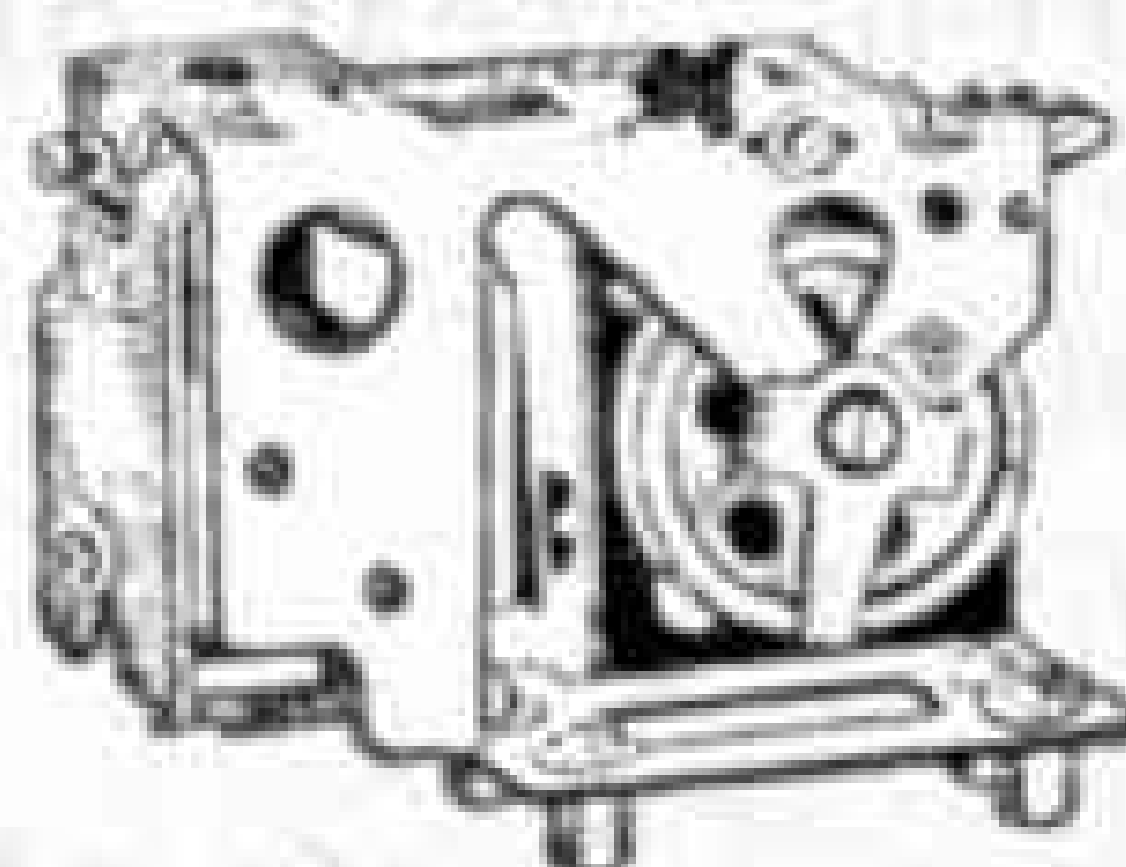
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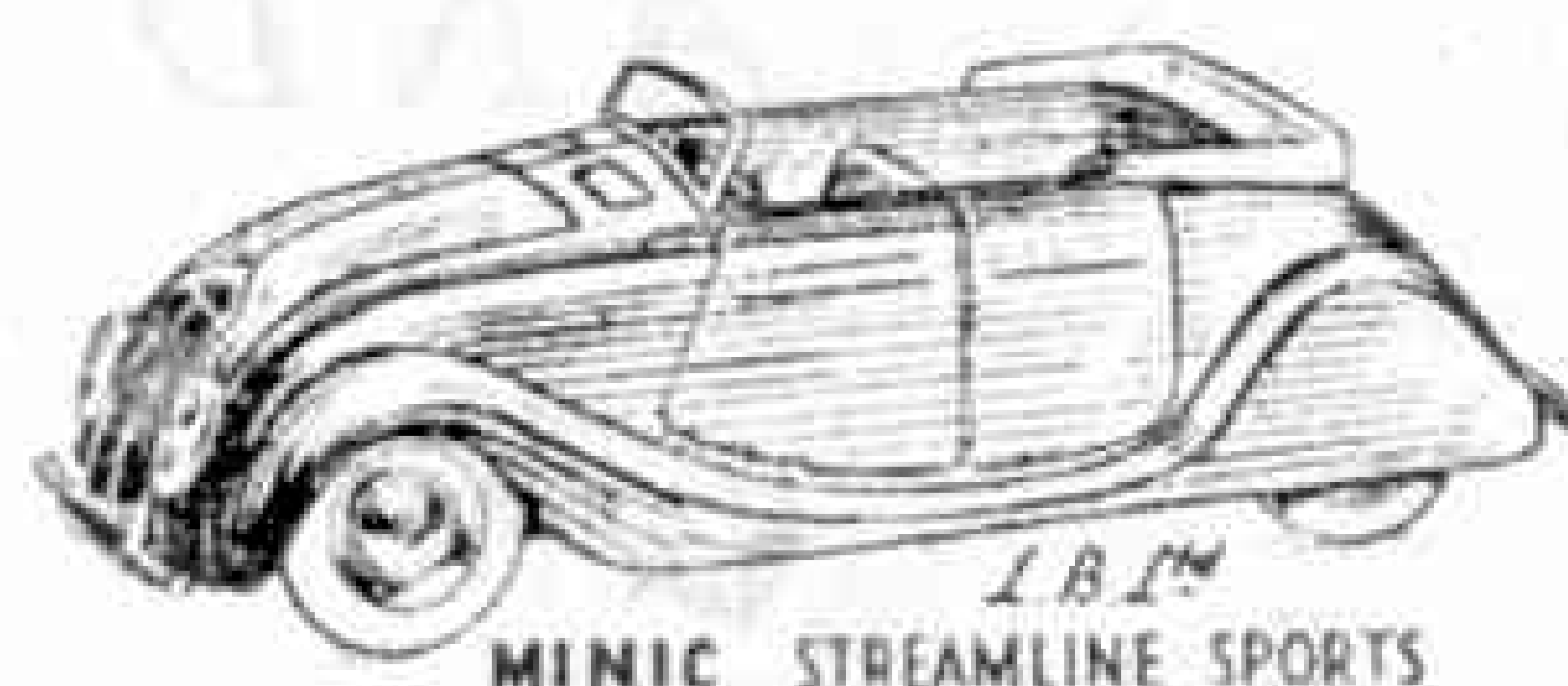
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MAGAZINE

Editorial Office:
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Vol. XXXIV
No. 2
February 1949

With the Editor

Sir Malcolm Campbell

The year 1948 as it passed took with it a great figure in English land and water speed record breaking—Sir Malcolm Campbell.

He was born in 1885, and even in his school days was keenly interested in racing. He became an underwriter at Lloyds, but his mind was concentrated on motor cars and aeroplanes, and in 1910 he began his brilliant career as a driver of high-speed cars. In the first World War he served in the Army and in the Royal Flying Corps, and after the war continued racing at Brooklands. With his successive "Bluebirds" he broke record after record at Pendine, at Daytona Beach and finally at Bonneville Flats, Utah, where in September 1935 he was the first to achieve a speed of more than 300 m.p.h. The record of 301.13 m.p.h. he made at that time has

since been broken by Eyston and Cobb, and the latter's record of 394.2 m.p.h., set up in 1947, still stands.

After Daytona Sir Malcolm turned his

attention to the water speed record. In 1937 on Lake Maggiore he reached a speed of 129.5 m.p.h., and in the following year on Lake Hallwill he attained 130.86 m.p.h. His crowning effort was made on Coniston Water in 1939, with a new "Bluebird" designed by Vosper Ltd. and powered by a Rolls-Royce engine. He then attained a speed of 141.7 m.p.h. which still stands as the water record. After the war he began to think of records with jet engines, but his failing health prevented him from completing his experiments.

Sir Malcolm will long be remembered for his

courage and determination in gaining new records for England. He was one of the most picturesque figures of his day.



Sir Malcolm Campbell in his "Bluebird."

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Vickers "Viscount," the first turbo-prop air liner. Photograph by courtesy of Vickers-Armstrongs Ltd.

Safety for Air Passengers

By C. G. Grey

ONE problem of Air Transport which is making everybody concerned think hard is how to make flying safer for air passengers. It is not just how to prevent crashes in which passengers may be killed, but how to prevent the killing or maiming or hurting of passengers, or even their discomfort, in a quite slight accident or when there has been no accident at all. After quite a serious crash one reads that only two or three (generally the pilot and crew up in the nose) were killed, and after a comparatively minor crash one reads that out of a crew of three or four, and ten or a dozen passengers, only two or three survived—just as on roads and railways.

Mind you, deaths in aircraft, or injuries, are few for the miles travelled, and considering the speed. But we want to get them down to vanishing point, so all possible causes have to be discovered, and discussed. A still greater puzzle is when, as in that crash at Prestwick in October last, four or five are pulled out alive, or are thrown clear of the wreck, in which 35 or so have been killed, the survivors died days or weeks afterwards of burns or internal injuries. They were obviously so near not being fatally injured that with a little better luck they and others might have survived. And in an opposite case there was that Lockheed crash nearly at the end of the war, when the pilot had to turn back and do a belly landing because of a failing engine, the only person killed out of 10 or 12, was Group Capt. Sir Nigel Norman (the founder of Heston Aerodrome, and the great pioneer of airborne troop-carrying), who, after seeing that all the

rest were in good positions to stand a crash landing, took a wrong position himself, and had his neck broken.

There is such a narrow margin between being killed and staying alive—as when a person steps on a vacant banana skin and bangs his head on the pavement. It may be a hilariously funny sight or a horrid tragedy. And that is the kind of thing all these clever people are trying to stop.

Naturally, the aircraft designers and builders are doing their best, because, apart from enthusiasm for air transport, their living depends upon inducing people to travel by air; and a high death rate, or a lot of injuries, is a bad advertisement. But too many of those who have spent most of their lives in aviation have, in two wars and much experimental flying, acquired a certain callousness about accidents and have come to regard them rather as "Acts of God or the King's enemies," as the Insurance phrase has it. They forget the balancing proverb: "The Lord helps those who help themselves," and don't do enough to help to stop accidents.

Air Forces and air transport concerns of all (or most) nations try to discover causes of accidents. Dead or injured pilots or aircrews weaken a fighting service, and casualties among airline pilots decrease profits. So that is why we, and other countries, have Aeronautical Inspection Departments to assure that material and design and construction are reliable, and why most nations have air accidents investigation boards or departments or committees. Our A.I.D. was started about

1912, by my friend Major Fulton, R.A., and to-day the A.I.D. stamp on any piece of material is equivalent to the Hall Mark on silver. And our Accidents Investigation Department, under Air Commodore Vernon Brown, has the convincing quality of a Coroner's verdict or of a Judge in a Law Court.

Besides that we have the Air Registration Board, made up of members of the Aircraft Trade and sundry civilian experts, to which the Minister of Civil Aviation delegates the examination of all civil aircraft and the issue of "airworthiness certificates" without which no aircraft may legally be flown. Mr. R. E. Hardingham, O.B.E., the secretary of this responsible body, produced during 1948 a paper before the Royal Aeronautical Society entitled: "Aircraft Accidents—Can Chances of Survival be Increased." As a title that struck me as a bit grim, but the author faces facts. "Accidents *will* happen in the best-regulated families," as the old saying has it.

As he said when we were talking over these things: "An aeroplane ought not only to be airworthy, it ought to be *crashworthy*." The designer who said "I design my aeroplanes to fly, not to crash," was a fool. If the engine, or engines, stop, an aeroplane is exactly in the position of a car on a steep hill if the brakes, and the transmission, fail. There is nothing the driver can do till he reaches the bottom. And what happens then depends largely on his skill and judgment in making a forced landing, but still more on what the machine hits. And that is where crashworthiness comes in.

Many of you, I imagine, have seen young men, formerly pilots in the R.A.F., whose faces have been damaged by hitting the gun-butt or sight, or an instrument on the dashboard—"the clock on the mantelpiece" as one bright lad put it—when doing a crash landing, or merely standing a trainer on its nose when

learning; which you can still do, if careless. We want to stop all that.

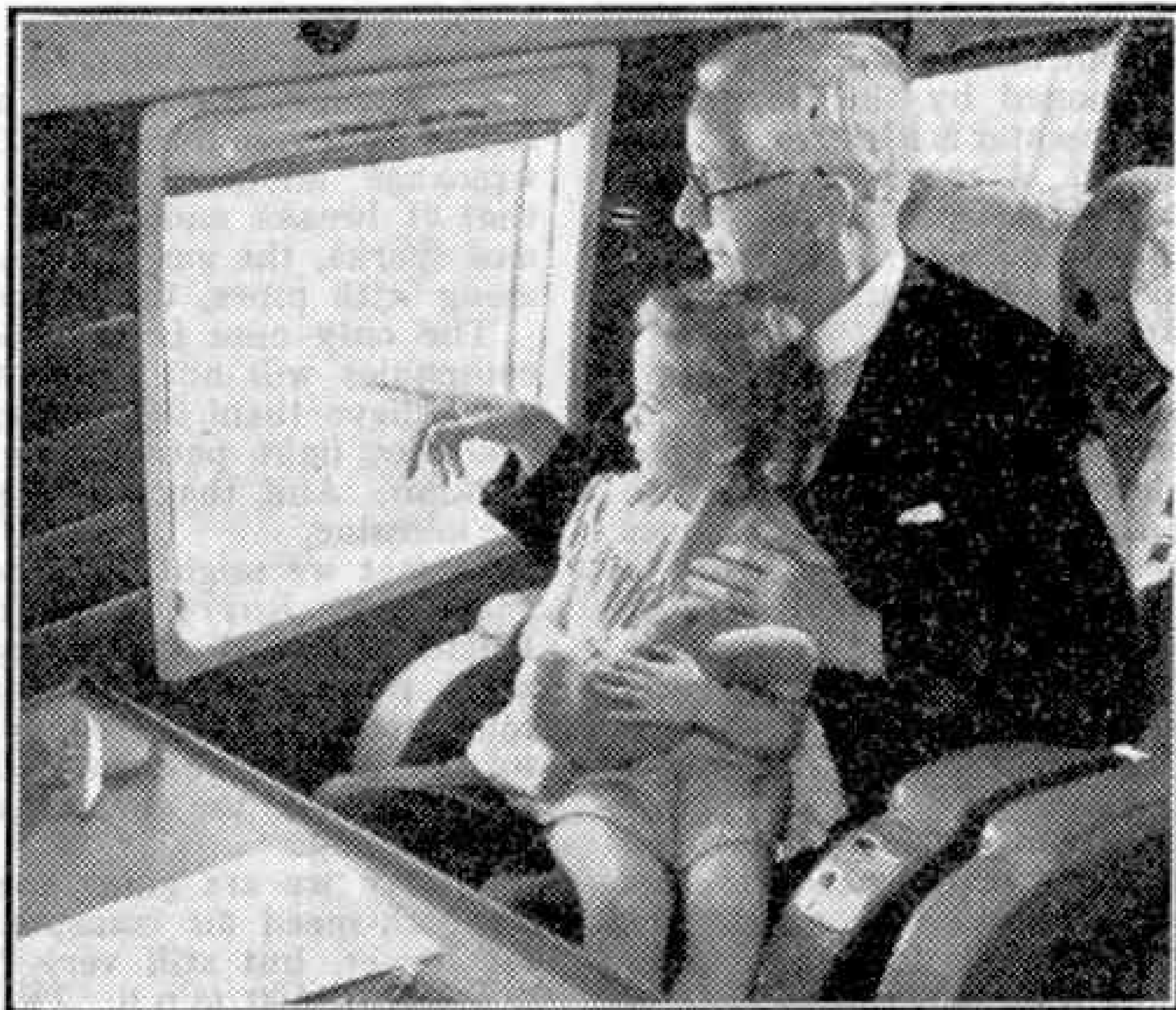
Quite early in the game someone introduced safety belts, wide pieces of canvas in front of the pilot's stomach, attached by elastic to the frame, or fuselage, behind the seat. That was all right so far. But in a real crash, after a spin for example, the belt might pull out of its anchorage, or break. Or sometimes the belt held and ruptured the inside of the pilot. In passenger machines, where the belts are sometimes fastened to the seats, the weight of the passenger may pull the seat up by the roots, and let him fall forward to smash his face or break his neck. That is being stopped.

The remedy, up to a very extreme point, is to "sit with your back to the engine." The human frame can take a terrific strain backward, when the "insides" are thrown back into the cavity formed by the ribs. And the skull, resting against upholstery, is not likely to fracture, as when catapulted forward. Personally I always travel backward in a train, because if the brakes go on suddenly I would rather be pushed

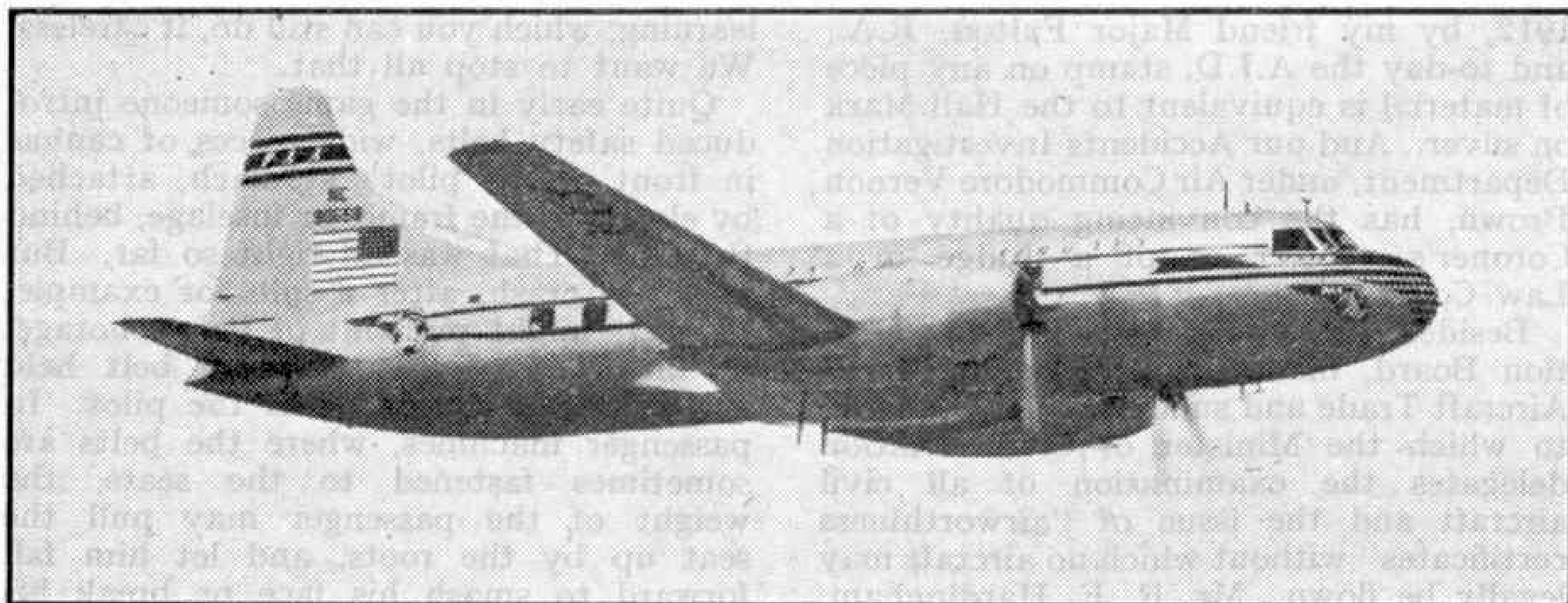
back into my seat by inertia than forward out of it. As Mr. Hardingham says, to be thrown forward against a knob or projection can be as lethal as a pole-axe—so all cabin fittings should be flush.

A.R.B. analysis shows that not more than 10 per cent. of all accidents are, as Mr. Hardingham says, "associated with catastrophic impact," such as when an aircraft flies into a vertical cliff, or dives into the ground after a structural breakage or collision. So something ought to be possible to save passengers in 90 per cent. of accidents. The other 10 per cent. are less frequent than trains running off rails or ships hitting rocks.

Coming down in water, or "ditching" as the aircrews call it, has caused deaths, mostly by drowning, because landplanes do not float for long; and often, when



Viewing the landscape from the cabin of a B.E.A. Vickers "Viking" air liner. Photograph by courtesy of British European Airways.



The Convair-240, a new-type Pan American World Airways "Clipper" in service on P.A.A. Latin American routes. It is the first twin-engined aircraft with a pressurized cabin for high altitude flying, and carries 40 passengers and a crew of four. Photograph by courtesy of Pan American World Airways System.

passengers have been pulled out before being drowned, they have already been damaged by the impact of the machine with the water, for water is a bit worse than concrete in a "belly" landing. A machine will slide on concrete. It digs in and stops suddenly in water. But again, few air liners have come down in the sea. Such experience as we have was got during the war, when damaged aircraft had to ditch.

Obviously fire is the worst danger. Nobody knows how many passengers and aircrews, especially in the Fighting Services, before, during and between and since the two wars, have been burned to death because they were trapped in wreckage, one hopes when unconscious, or when too badly injured to get out. Many certainly have been burned because there were no adequate emergency exits, or because (as in so many theatre and cinema fires) the exits were jammed by hysterical passengers. But fires when flying are rare. They have mostly happened in bad landings.

Mr. Hardingham, by no means a pessimist, says: "In one of my early flights I experienced no less than four forced landings between London and Newcastle with never a thought of danger; in some modern transport aeroplanes the chances are that in four forced landings I would be quite likely to be burned to death twice." Which only shows how far we are still from my ideal aeroplane which "will land slowly and won't burn up after a crack up." But we are progressing. Early aircraft were so slow that pilots could land them without crashing.

Emergency exits are as important in flying boats as in landplanes. Quite recently several people were drowned in the Persian Gulf because the bottom of a flying boat caved in when the boat landed badly and there was no quick and simple way out. I know of several other cases. And in these big landplanes there is no good in providing "openings through which an occupant can only go head first to a 10 or 12 foot drop to the ground, without even a handhold." Again I quote Mr. Hardingham with hearty approval.

A lot has been done to lessen the danger of fire. Unburstable "bag" tanks for the petrol, flexible petrol-pipes which will not be fractured by vibration, or even in a moderate crash, automatic fire extinguishers which cover everything with some horrible but non-inflammable "gooey" substance, and many other things. But the only, and ultimately the inevitable, way out is to quit using petrol, or "gasoline."

Our jet and turbo-prop engines use kerosine (a rather finer paraffin oil) which, although it burns furiously when set alight by contact with a flame does not give off volatile vapours which catch fire from a spark feet, or yards, away.

The danger of petrol is that a slight leak from a cracked pipe will fill the air for yards around with highly inflammable gas. Then if, say in pulling wreckage about, someone pulls an electric wire so that it breaks and makes a spark, or short-circuits and sparks, the gas catches fire, and up goes the lot, along with pipes, tanks and everything inflammable.

The only cure is the abolition of petrol. The oil companies will not mind, for the use of heavier oil will relieve them of the expense of whatever process produces light petrol from the heavier kerosine or paraffin. And they will be able to charge more for the kerosine.

In fact we might have been using kerosine twenty years ago. Roy Fedden (now Sir Roy) late of the Bristol Co., had a diesel-type engine which gave as much power for weight as did a petrol engine of the same size a year or so before. He wanted £40,000 to develop the heavy-oil engine to the same weight-for-power as the petrol engine, but it was not forthcoming.

To-day we are going over to turbo-jet propulsion for high-speed air transport, and to turbo-propellers for slower, but still very fast passenger transport—say 450 to 500 m.p.h. That will do away with most of the fire risk. And, what with slots and flaps on the wings, and reversible airscrews, and improved tyres and brakes, we are getting close to the aircraft which will land slowly and not burn up in a crack-up, which I have preached for so many years. The Vickers "Viscount," with four Rolls-Royce "Dart" turbo-prop engines, is very near it. An illustration of this machine appears on page 46.

A very different problem in passengers' comfort, and to a certain extent safety, is supercharging. I suppose that everybody knows to-day that the higher you go the thinner the air becomes and the greater grows the difficulty of breathing. Up to about 8,000 ft. one hardly notices any difference, unless one has to run or work hard. At 12,000 one becomes sluggish. At 16,000, for most people, breathing becomes difficult, and even experienced pilots start breathing oxygen through a mask.

At 40,000 even oxygen ceases to be useful, because there is not enough atmospheric pressure to push it down into the lungs. (Incidentally most people do not realize that there is no such thing as "suction." What we call suction, whether by mouth or by pump or as in the suction stroke of an engine, does not suck anything in. It merely removes something—whether air, gas or liquid, and so leaves room for atmospheric pressure to push something else into the vacant space).

So we supercharge engines, to push more air and petrol mixture into them. And in these days we have the practise of supercharging the cabins of

aeroplanes to keep the air pressure up to what passengers would breathe on the ground up to about 8,000 ft. or so. This is not only for the comfort but for the safety of passengers. Years ago, before supercharging or oxygen came in, some friends of mine, flying from Chile to Argentina, were in the cabin of a 3-engined Junkers with a little fat man, who began to gasp at about 8,000 ft., and at 14,000 over the high pass had to be put lying flat on the floor to give him a chance of breathing. He survived, but they were afraid that only a corpse would arrive at Mendoza in the Argentine.

In a modern aircraft one never notices any change in pressure. Early this year I went up in a Douglas D.C.6. We flew up into clouds and came out over the Thames, and recognized Gravesend by the cement works. Chatham looked small, and then we crossed the river and saw a thing like a match sticking out from the shore below. Suddenly we realized that that was the famous Southend Pier, which is about a mile and a half long. Which meant that it must have been four or five miles below us, or say 20,000 ft. But the air pressure was so well maintained that we never felt any shortage, and the stewards were running about serving drinks as if on land.

At great heights where the air is so thin that there is not enough to breathe, the supercharger fans must work like billy-oh to catch enough air to compress up to breathable thickness. Think it over.

This pressure is so great compared with the lack of pressure outside that if a bad leak happened at 25,000 ft. or so the passengers would probably die before the machine could get down to breathable air. Once when crossing the Atlantic the navigator of a liner went up into what is called the "astrodome"—a dome of transparent plastic through which to read the stars, when something better than radio direction is wanted. Whether he hit the frozen plastic nobody knows, but the thing burst, as has happened in high-flying jet fighters, and the unlucky man was blown out by the pressure in the cabin and disappeared, without a parachute, into the darkness. The pilot got down to a low level before the supercharger pumps were beaten by the leakage.

Which brings up the question of parachutes—why are they not carried by air liners? Simply because, even if the Law or the airline ordered that every passenger must wear a parachute, very few would step overboard into space when told to do so. Several clever people have suggested making a cabin (something like a bomb bay) which could be dropped bodily

under a huge parachute, full of passengers.

Actually there have been hardly any accidents in airline work in which single or collective parachutes would have saved anybody. The great majority of accidents happen when taking off or landing, when parachutes would be no use, because there would not be room below for them to open. And a parachute adds about 30 lb. to the weight of the wearer—say 900 lb. in a 30-seat liner, which is a big loss of payload.

Life-belts, to be worn if ditched, are another matter. There is generally a chance of getting out and floating, before the machine sinks. In any case, only flying boats should be allowed over long stretches of water.

Practically the only times when parachutes would be any use at all would be when fire broke out. And the best guard against that is abolishing petrol, or fitting reliable extinguishers. If controls break or jam, a skilful pilot can almost always get down by some improvised way of overcoming the effect of the breakage. But in a major breakage, such as having a wing broken off in a collision, the machine would whirl round and drop so fast that neither passengers nor crew would be able to get out. They would be stuck in their places by centrifugal force. So, except in case of fire, the safest thing to do is to stick to the ship.

Lastly there is the question of radio, or radar, radio being signalling or telephoning, and radar being searching the sky and getting echoes, or "bouncing beams," from radio rays. Radar did much to help us to find and fix enemy aircraft in the war, particularly the Battle of Britain. It has done a lot in Air Transport and, in conjunction with radio, to find and bring in aircraft in fog or low cloud. But, as so often with new inventions, the protagonists (which is the opposite to antagonists) of radar have done a lot of harm by building up false hopes in the course of their "empire-building"—as the Air Force calls the pushing or advertising or building up of any one idea.

The "empire" of radar will come some day, but to-day it is not so reliable as visual or audible signalling. Like my old friend, the great pioneer of flying, Col. S. F. Cody, I mistrust any sort of "electrickery" as he called it. Why! we can't even trust the batteries or starters or dynamos or even the sparking plugs in our cars. But they all help.

Flying to-day is about where railway travel was in 1840; it is dangerous, but worth while.

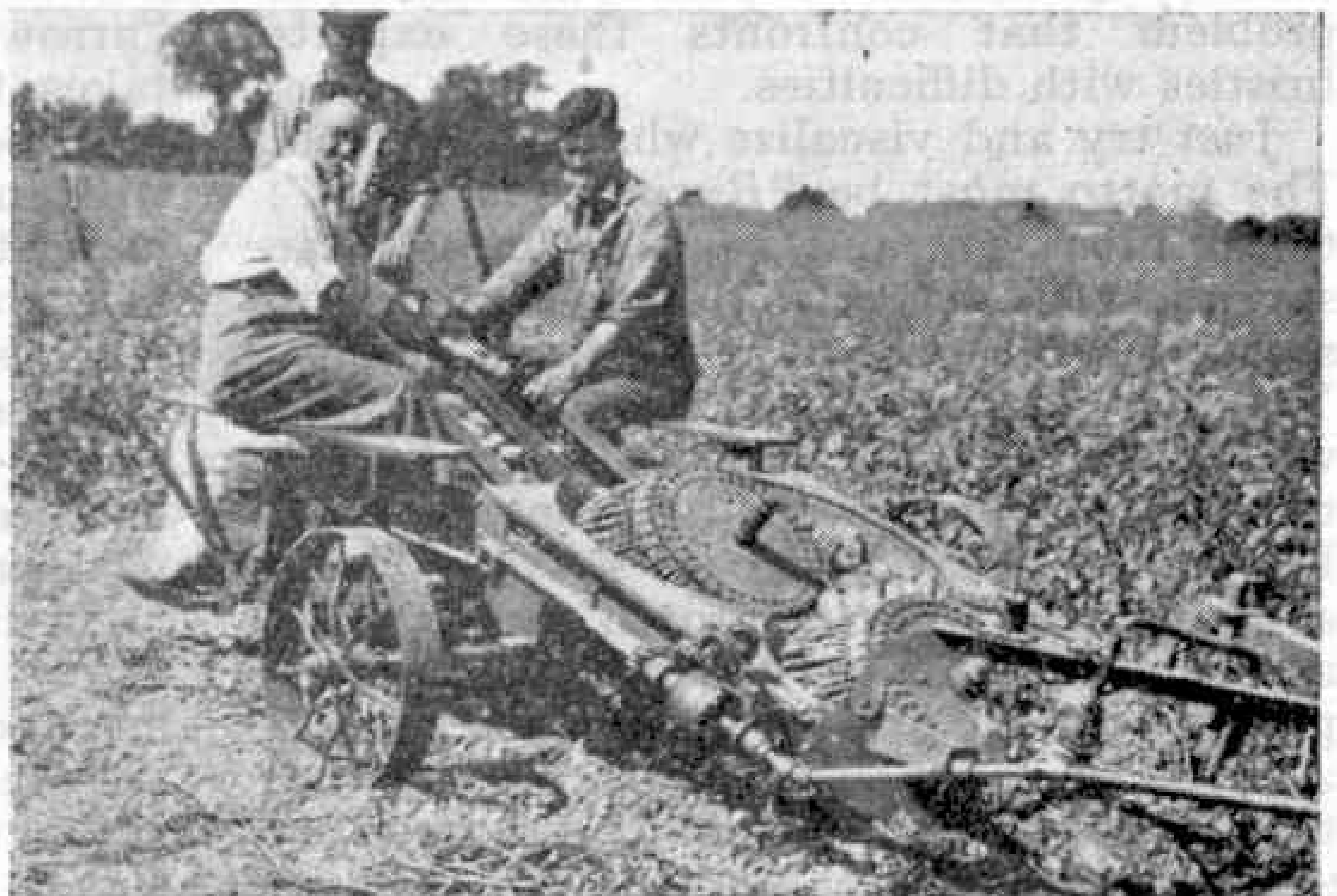
A New Way of Harvesting Potatoes

The potato harvester at work illustrated here is of an entirely new type. It digs up the crop by means of a share; and the potatoes, mixed with soil and stones, are then picked up by a rotating disc that has a series of fingers on its circumference. Most of the soil and stone is lost between the fingers, which continually change position relative to each other, and the potatoes are dropped on to a second rotating element, which carries them further up the machine and sieves out more soil and stones.

From the second disc the potatoes fall on to a conveyor belt that carries them along the machine. This belt is divided into three portions along its length. The mixture of potatoes and earth falls into the middle portion, and pickers seated on benches at the side lift the potatoes and drop them into the outside divisions, leaving the rest of the soil to drop off the conveyor at the end. These potatoes pass into hoppers that load them directly into bags, and a picker at the rear changes bags as necessary.

With an average crop of 10 tons an acre the harvester will lift potatoes at

the rate of 1 cwt. a minute. It is the product of the Globe Harvester Co. Ltd., to whom we are indebted for our illustration.



Prefabricated Station Platforms

Concrete Unit Construction

By "S.M."

ONE of the stations under my supervision is a small "*Exchange*" and it was decided recently to put in hand the renewal of its platforms.

The original construction of these took the form of timber uprights and to these horizontal timbers were bolted. Sleeper timbers were also placed at the rear of the platform, forming anchors as it were. These were secured to the front timbers at intervals by very long bolts. The space between was filled up with large rocks and so on at the lowest level, graded until at the highest level the packing is ordinary earth with a top coat of granite chippings forming the platform surface.

Despite the fact that all timbers were thoroughly creosoted, wood does rot in time, and these platforms have stood very many years. So the Engineer has given his verdict; they must go. Just as decisively, too, they must be replaced; so the job is handed over to the specialists to sort out, and the problem that confronts these experts bristles with difficulties.

Just try and visualize what is involved. The motto must be "*Business as usual*"; trains must continue to run through the station, and the normal activities of the station itself must not be hindered unduly. Yet for weeks the platforms and permanent way will be littered with materials for the new work and the debris from the old. Dangerous situations could develop if the arrangements laid down were not absolutely water-tight, and the appropriate rules and regulations rigidly adhered to. The Rule Book provides all the answers to this, and hundreds of similar posers.

Where, on account of engineering and similar work, it is necessary at short notice or for a short period of time to restrict the speed of trains, hand signalmen are detailed to give the necessary warning to drivers. In a typical instance each man would be provided with detonators, green and red flags, and if necessary a hand-

lamp. One man would be stationed at the site, and another at a point half a mile in rear of it. The latter would place a detonator on the rail, and on the approach of a train would show to the driver a green flag by day or a green light at night. He would wave this slowly from side to side. The driver knows from this that he must at once reduce speed to 15 m.p.h. or such other reduced speed as may be required.

Now we cannot monopolize men for weeks on end as hand signalmen, for these men are usually platelayers or lengthmen, and have their own regular jobs to do.

But is there a safe alternative? Yes. The "arrow" sign illustrated on the next page takes the place of the man at the half-mile point. You will see that the figure "1" in this illustration has been made ineffective, leaving the "5." The arrangements will by now have appeared in printed Notices, copies of which are given to all trainmen and other staff concerned, and this 5 m.p.h. is the speed limit which it has been decided shall be imposed for this particular work.

A driver approaching, on seeing this arrow sign, is at once reminded of the arrangements he has read in the Notice, and reduces his speed. As he nears the actual site he sees the "C (commencement) sign," which is a black letter on a white

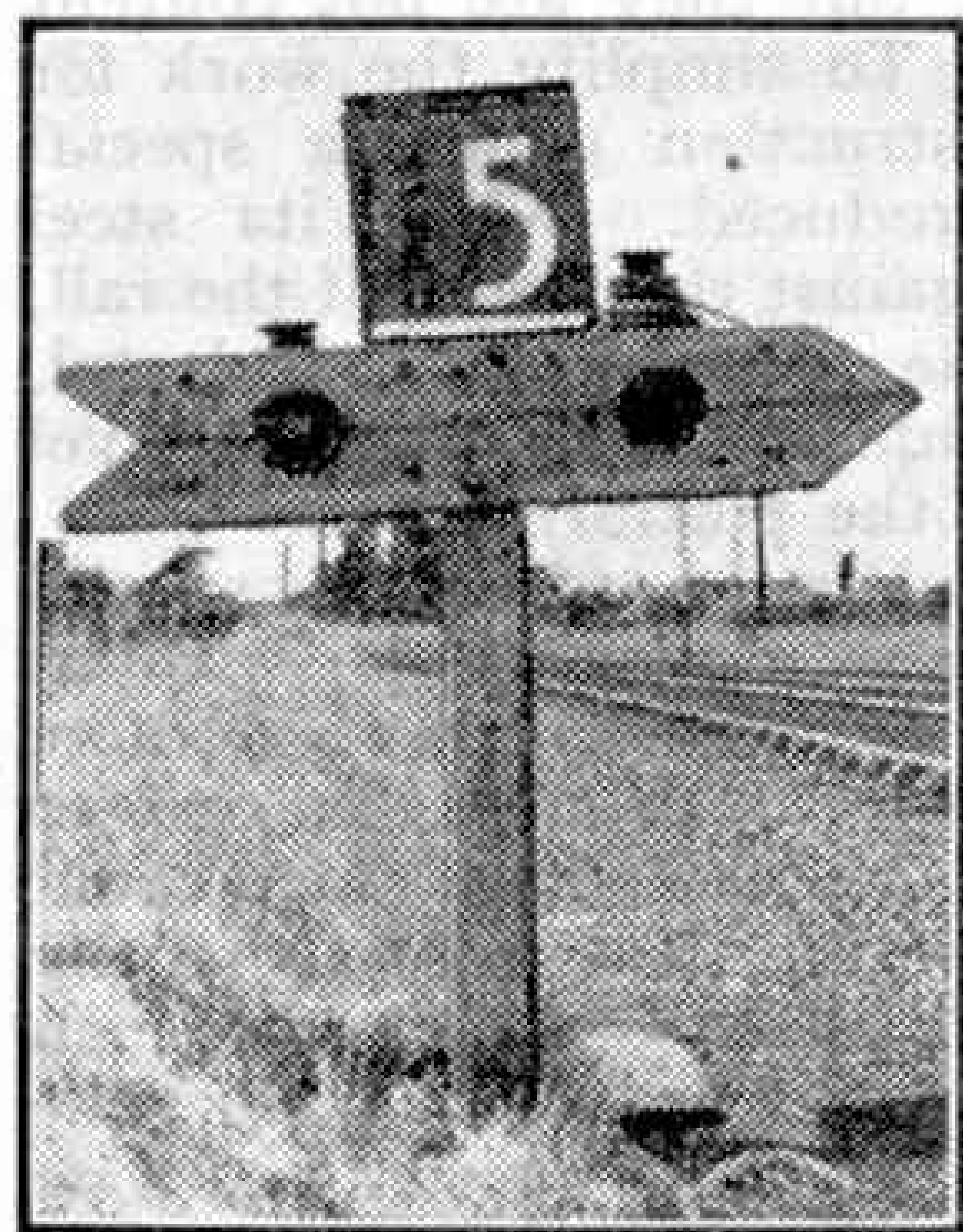


The look-out man with his warning equipment, and distinctive armlet. He carries red and green flags, detonators and a horn or whistle.

background. The point of termination of the work is marked, again appropriately, with a "T," this being white on black background. After passing this the driver

may resume normal speed.

If trains continue to run after dusk the indicators are illuminated, and this is done also during fog or falling snow. In the latter event, however, a hand signalman



The "arrow" sign signifies a slack ahead and the speed limit laid down.

must be provided at the outermost indicator (the "arrow" sign). This hand signalman will place a detonator on the line to be exploded by the passing train, and exhibit a green hand signal waved slowly from side to side.

In addition to the illumination of the stencil figure showing the speed to be observed, the "arrow" sign is provided with a green light and a white light in the left-hand and right-hand circular apertures respectively. These warning indicators will remain in position until such time as the work no longer warrants a reduction in speed being observed.

For the final safety measure we must have a man termed a look-out man. His job is to protect the workmen, and he wears an armlet inscribed "Look-out." He carries a horn (sometimes a whistle is used) on which he sounds a lusty blast as each train appears in the distance. The Foreman in charge at once orders his men to safety, after glancing quickly around to ensure that nothing is lying foul of the line. The look-out man's remaining equipment follows the usual pattern, namely, everything necessary to enable him to bring a train to a complete stand should this course become necessary.

Remember that the train is only moving at 5 m.p.h. anyway.

With these precautions in force we can get on with the job. At my station the "Down" platform was chosen first, as this was in far worse shape than the "Up." In addition, it is at the down end that there is a sleeper crossing for staff and passenger exits, there being no overbridge at this station.

In passing it may interest readers to know

of a simple but effective method of warning staff of the approach of an up train. Down trains are visible at this station for a considerable distance, but it is not so with up trains, as another route crossing my line on a bridge is situated only a few yards away. This bridge can be seen in the illustration of the "T" sign. Furthermore, the line curves so that there would be very little warning. Just out of sight beyond this bridge is the up starting signal worked from the Box in rear of "Exchange" station, and when the signalman there places this signal to the "Off" position, it automatically closes an electrical circuit in which there is a large-gonged bell. That bell continues to ring loudly until the train has passed through the station and the signal has been restored to the normal position, which breaks the circuit.

But to return to our platform. The sloping ends of platforms are called ramps, and our gang are going to work to a plan whereby whatever piece of platform they start on will be converted to the new construction by the end of that day. First, the



The "C" sign shows where the slack begins.



The "T" sign shows where the slack ends.

old timber is removed and a certain amount of excavating done, but no more than necessary.

All the units that form the new set-up are pre-cast reinforced concrete. The uprights, which are the backbone of the structure, are called pedestals, and each one is standard and has a number by which it is known. For example the largest ones—those that support the platform, at its full height—are called "P.1"; the next size "P.2," and so on.

At first sight these pedestals might appear uninteresting, but wait—just take a glance at the illustration on this page. This shows how each part fits together. How are we to ensure that our platform shall, on completion, be the correct distance from the rails, laterally and vertically? In the illustration you will see on each pedestal a V-shaped channel, technically known as a "chase," and this performs a very special function. You will notice also a large hole roughly central in the upright portion. This is to carry electrical conduits or gas pipes. The smaller holes further up are for signal wires, and those in the lower two flags forming the front retaining wall are simply for drainage.

Now for our "chase." "Exchange" station is on a very slight curve, but to simplify matters we will assume that its platforms are absolutely straight. The pedestals are designed so that, when the flags are placed in position, the top flag edge is exactly 3 ft. high measured vertically from the level of the near rail. The chase corresponds to the height of the top of the near rail, so that the work can be checked as it progresses by putting a straight-edge from rail-top to chase, when it should show level. An imaginary vertical line drawn down from the platform edge would intersect with the straight-edge at a point 2 ft. 4 $\frac{3}{4}$ in. from the inside edge of

the rail. On curves this latter distance is increased slightly.

The designers of these concrete units have achieved a commendable piece of standardisation, but they are not content with just that. To simplify the work for the actual construction gangs, a special gauge was introduced. When its steel stop is placed against the inside of the rail, in line with the chase on the pedestal, the top of the upright arm must be level with the top of the platform.

With the assistance of these special features we can move faster without sacrificing accuracy. It surprised me to see how much could be accomplished by a small gang of men in one day. The pedestals are positioned securely and checked carefully; the rear flags are placed, and finally the top flags. Then the hard core as it is called—rocks, stones and earth—is replaced and tamped down solidly. This completes that particular piece of platform, except for cleaning up. When the whole of the platform is finished, a second line of flags is placed against the edge flags, and then a layer of chippings will cover the remaining surface.



How the pre-cast concrete platform units fit.

This article is confined to platform construction, but similar methods are used in many other fields of railway maintenance.

A few miles away, there is a Motive Power Depot, and the Shed there has been entirely rebuilt, using pre-cast interlocking units. This job also had to be completed without interference with the working. Even small buildings are being designed on the same lines.

I have just returned from "Exchange," and the new work on the "down" side gleams in the sunlight, increasing my eagerness to see the transformation completed.

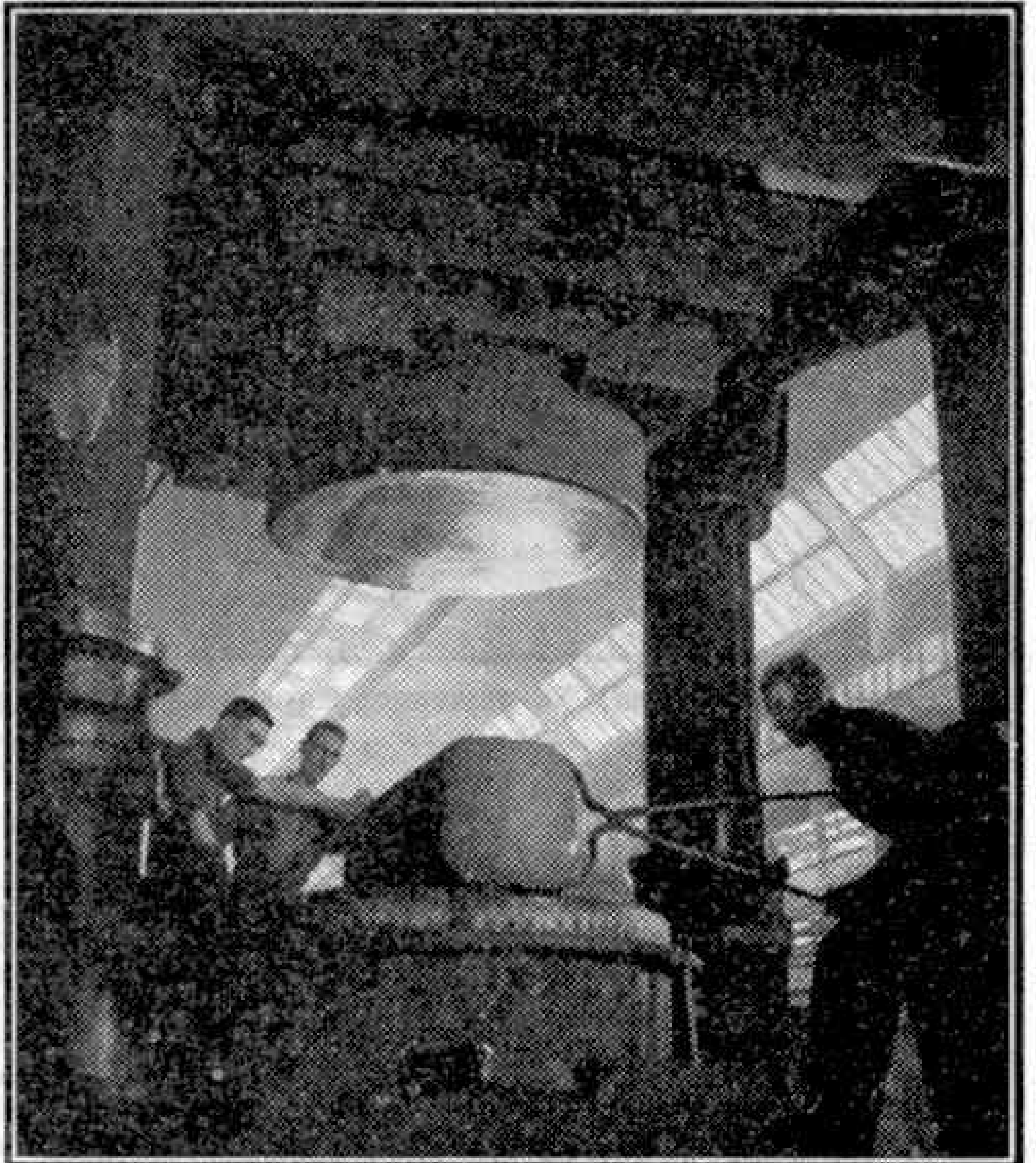
How shabby our up platform appears by comparison! But its turn will come within a few weeks; and probably as you read this it too has been brought right up to date.

Light Alloy Forging Methods

NOBODY knows who first discovered that when metal has been heated to the right temperature it can be hammered into an almost unlimited variety of shapes, but it is certain that the art of the blacksmith is one of the oldest in existence. It still has an important part to play in numerous branches of engineering; but for many purposes, and especially when the mass production of a large number of similar parts is required, hand methods have given way to die forgings using drop stamps and large forging presses.

The Schloemann press which we show on this page and in our cover picture is an interesting example of one of the many types of forging machines now in use. It is capable of exerting a total pressure of 3,000 tons, considerably more than even the "large and sinewy hands" of the original village blacksmith could have achieved! The press is employed in the works of High Duty Alloys in the manufacture of forgings from "Hiduminium" aluminium alloys. According to the makers, these alloys combine the lightness of aluminium with the strength of steel, and are widely used in the construction of aircraft and aero engines and also in the textile, building, cycle and many other industries.

Before dealing with the way in which the Schloemann press is used, let us first see how die forgings are made. Broadly speaking, the die forging process consists of taking a metal dummy or blank roughly the same overall form and size as the finished part that is required, heating it so that it will be fairly plastic and therefore will mould easily, and stamping it to shape on a drop stamp between two dies which contain a machined impression almost exactly corresponding to the part that is to be made. When the dies come together, the top one being dropped from a height of several feet with a weight of between 10 cwt. and 18 tons attached to it, they thus in effect squeeze the dummy to the shape needed, any surplus metal being forced out through the parting line between them. When this has been done the part is removed, and then as a rule has only to be machined slightly. Some-

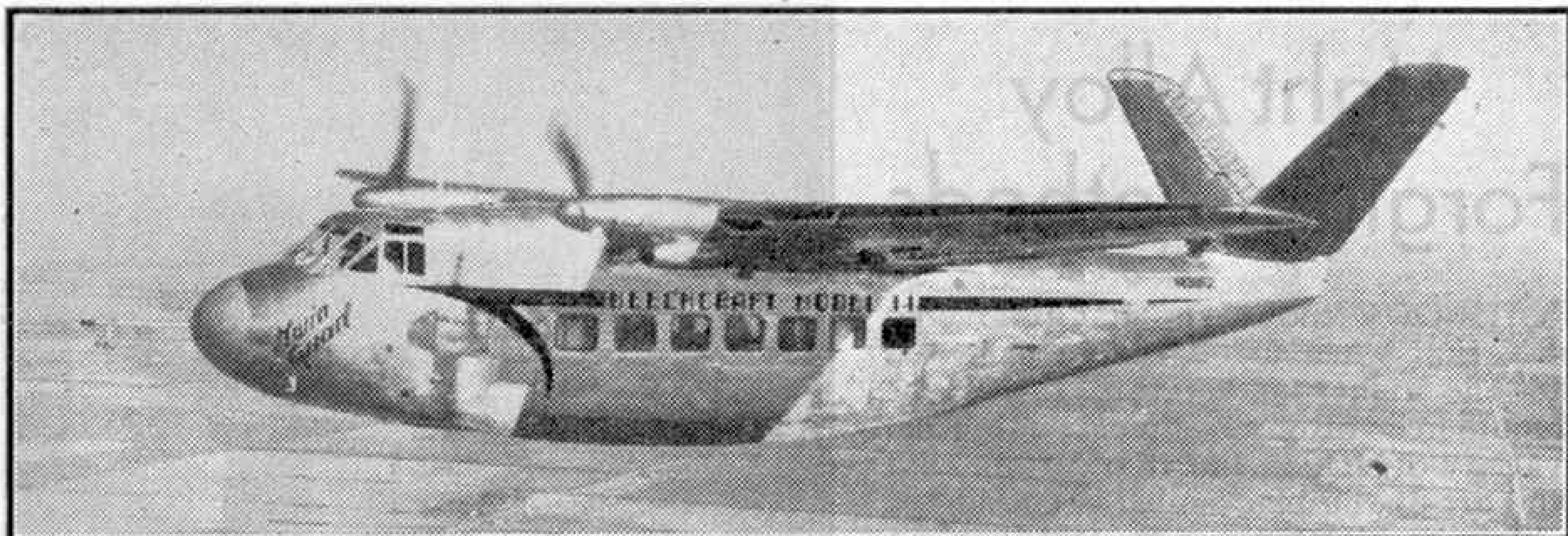


Pre-forging an ingot of "Hiduminium" alloy on a 3,000 ton Schloemann Press. This photograph and that on which our cover is based are by courtesy of High Duty Alloys Ltd.

times, however, several forging stages are necessary, each one stamping the dummy progressively closer and closer to the finished shape.

The Schloemann press is used at an earlier stage than all this, in the preparation of the actual dummies. In one process these are made from an ingot of metal which is cast in the foundry. When it is needed for use the ingot is heated, placed on the press and squashed down in precisely the same way that a slab of putty would be squashed if it were pressed down beneath a board. As soon as the ingot is flat enough the pressure is released, the ingot is stood up on its new end, and pressed down once more. This process, which is repeated several times, has the effect of breaking down the crystal structure of the cast ingot and makes it considerably stronger.

Much skill is exercised by the men who work the press, and by the time the operation is finished the ingot has been turned into a dummy which, as we have seen, has very roughly the contours of the finished stamping and will fit the impression machined in the stamping dies, leaving enough excess material to fill the bosses, flanges, webs, etc. In this way a very wide variety of parts can be made, including such things as crankcases for radial aero engines, supercharger rotors, and so on.



Beechcraft "Twin-Quad" 20-passenger transport. Photograph by courtesy of Beech Aircraft Corporation, U.S.A.

Air News

By John W. R. Taylor

An Unorthodox Transport Aircraft

The Beechcraft "Twin-Quad," illustrated above, is one of the most unorthodox aircraft ever built. Not only are its four 375 h.p. Lycoming engines completely enclosed within its wings, but they are coupled in pairs to drive only two propellers. In addition, it has a "Vee" tail and incorporates two emergency landing keels in the bottom of its fuselage—completely new features in an aircraft of this size. The effectiveness of the keels was proved recently when the "Twin-Quad" was belly-landed on them without any damage to its structure.

As a short-haul air carrier the "Twin-Quad" was designed to carry 20 passengers and their baggage, plus about 1,000 lb. of air mail. If required, the six forward passenger seats can be removed to provide increased freight stowage. It meets all C.A.A. requirements for operation from small fields, including single-engined take-off, and carries enough fuel for a range of 1,400 miles with a 45-min. reserve of fuel. Nor has passenger comfort been neglected; the view from the cabin is excellent, while the combination of slow-turning propellers and of engine exhausts above the wings results in a very quiet aeroplane.

"Sunderlands" to the Rescue

The Royal Air Force's "Sunderland" flying boats are so seldom in the news that one is likely to forget that they are still the mainstay of our anti-submarine squadrons. But a "Sunderland" recently hit the headlines with a fine air-sea rescue mission off Ceylon.

A boat containing five men from the village of Kalutara was overdue after a day of gales and heavy seas. The local police asked the help of the R.A.F. flying boat base at Koggala, and a "Sunderland" of No. 205 Squadron set out to look for the missing boat and crew. After a search lasting nearly an hour the fishermen were found eight miles from shore, sitting on the bottom of their capsized boat. The "Sunderland" dropped a rubber dinghy, in which the fishermen were able to sail back to the village, while the aircraft returned to base, having previously radioed to the police at Kalutara the good news of the successful conclusion of its rescue mission.

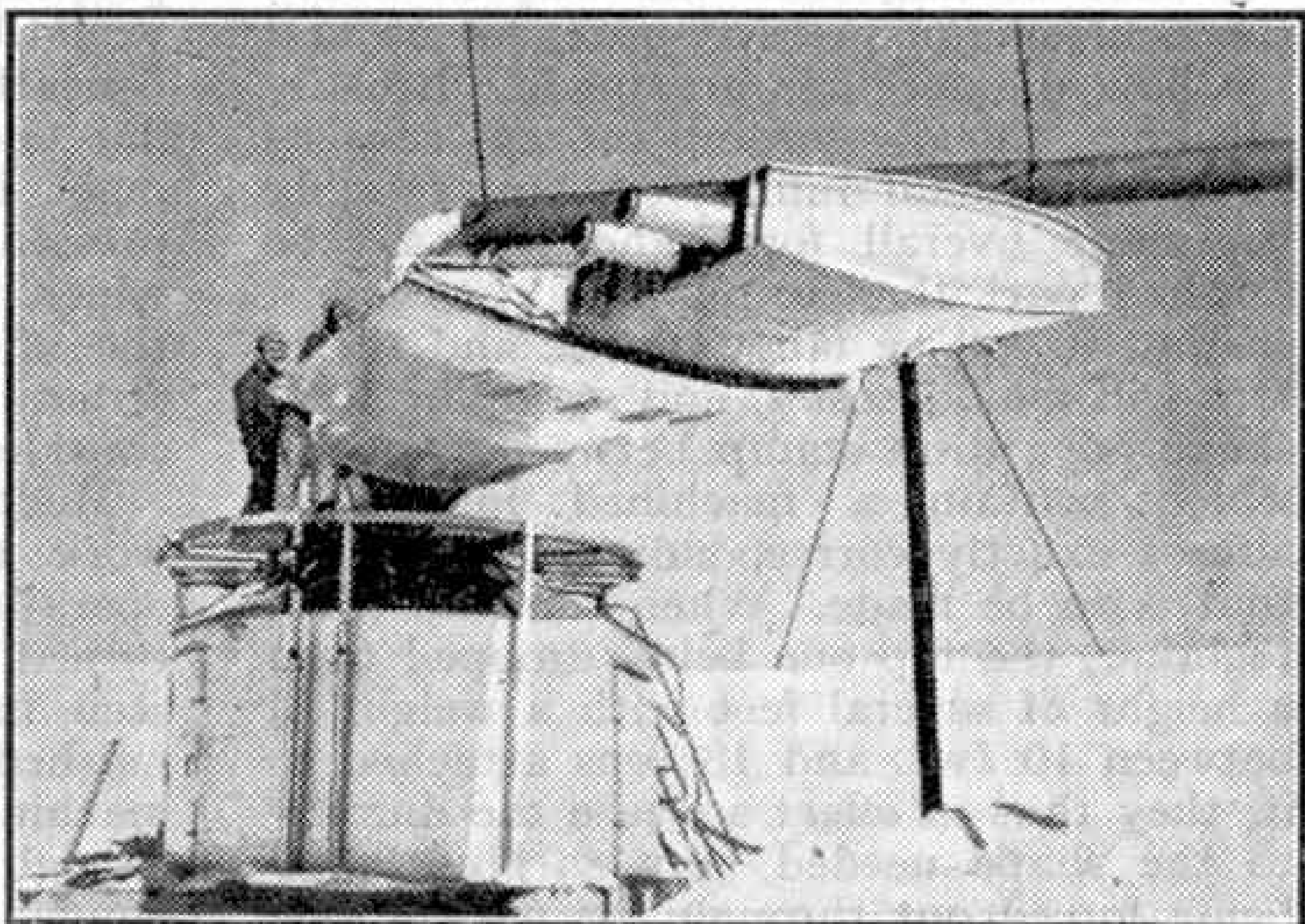
Bristol Propjet Air Liners for B.O.A.C.

B.O.A.C. have ordered through the Ministry of Supply 25 Bristol 175 propjet air liners, now in the early prototype stage. The design of Type 175 is based on B.O.A.C.'s "Medium-Range Empire" specification evolved in 1947, although, in its latest form, the aircraft represents a considerable advance on the original M.R.E. specification. Three versions of the new air liner are to be built. A night version will have 38 sleeping berths; a day version will seat 60 passengers, and another will seat 70 with less room per person, but at reduced fares.

The Type 175 will have four Bristol "Proteus" propjets, giving a cruising speed of 325 m.p.h. over a maximum still-air range of 2,500 miles. If these engines are not available in sufficient numbers, the first aircraft will have "Centaurus" piston engines as a temporary measure. The type should be in service with B.O.A.C. in 1953-54.

Flying-Wing Record

The U.S.A.F. have announced that the Northrop YB-49 flying-wing bomber, which is powered by eight General Electric jet engines, has broken all endurance records for jet aircraft in tests from Muroc air base, California. Flying a shuttle course of 3,458 miles, it remained in the air for 9 hr. 30 min. at between 35,000 and 40,000 ft. The aircraft's vapour trails sometimes stretched for 100 miles.



A new type of jet power plant for helicopters being prepared for a test at the General Electric Flight Test Centre, New York, as part of research in the development of helicopters for the U.S. Air Force. Photograph by courtesy of U.S. Air Force, Wash., D.C.



The Percival "Prince" 8-10 passenger transport described below. Photograph by courtesy of Percival Aircraft Ltd.

Quicker Service to Pakistan

A saving of over 12 hrs. on the B.O.A.C. flying boat service between Southampton and Karachi has resulted from the introduction on that route of Short "Plymouth" flying boats in place of "Hythe" class boats, and the omission of the night stops at Marseilles and Bahrein made by the "Hythes." Now the only night stops on the route are at Augusta and Alexandria. The "Plymouths" are equipped to carry 22 passengers, and complete the journey from Southampton to Karachi in just over 3½ days.

The Percival "Prince"

The compact little 8-10 seater aircraft shown at the top of this page is the Percival "Prince," developed from the Percival "Merganser," of which only one was produced, and is designed for a wide variety of transport duties. It combines a high-wing layout with a roomy cabin; a 6 ft. man can walk its length without stooping. The cabin is sound-proofed, and thanks to the high-wing design should be cool and free from glare in tropical countries. The floor level is low enough for a short, hinged step to suffice for passengers to enter and leave the machine.

A total of 55 cu. ft. of luggage space is normally provided aft of the cabin, the seats, walls and floor of which can be removed easily if the whole cabin is required for freight-carrying. Large double doors permit easy loading.

The "Prince" is fitted with two 520 h.p. Alvis "Leonides" engines, and can carry a full load for 800 miles at 177 m.p.h.

Atlantic Air Travel

Every third passenger over the Atlantic travels by air, according to statistics compiled between 4th January and 11th September, 1948. During that time, 161,615 passengers came by boat from North

America to Europe, and 74,205 came by air—46 per cent. of the number of boat passengers. In the opposite direction, 178,694 people went by boat to America, and 94,483 by aircraft—52 per cent. of the number of boat passengers. From 15th August to the 11th September, some 740 passengers a day flew over the North Atlantic.

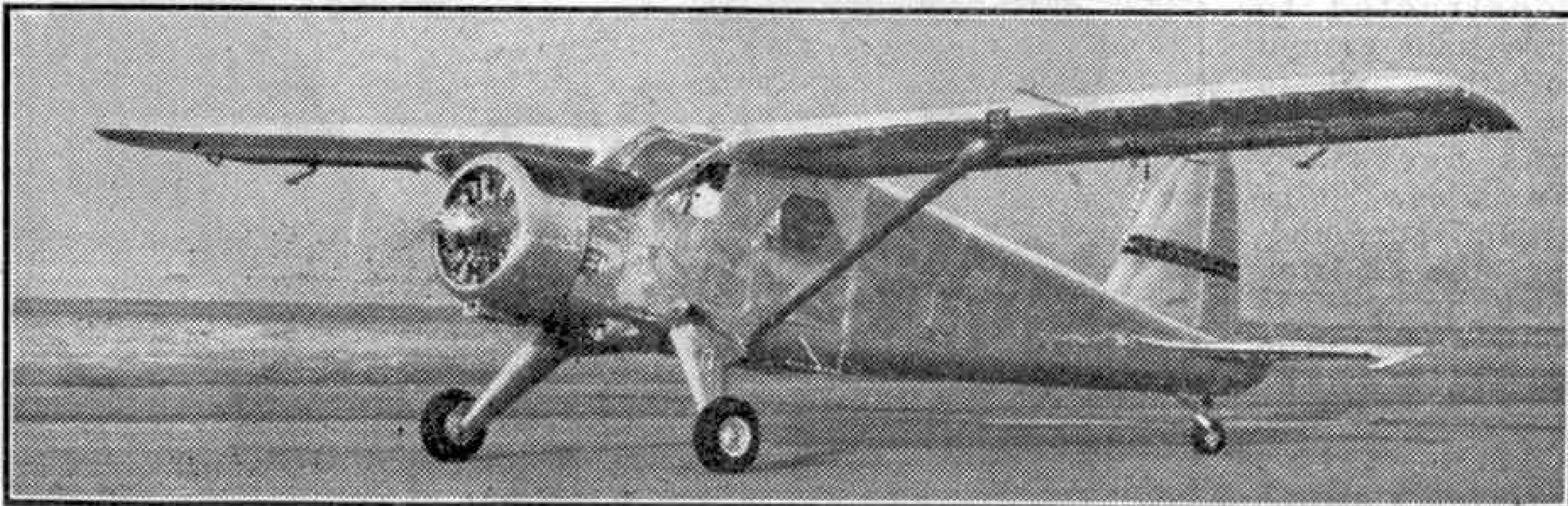
A Canadian Light Transport

The Canadian de Havilland "Beaver," shown in the lower photograph on this page, was designed as a replacement for the veteran "Fox Moth" used by Canada's famed bush-flyers. These men are not interested in streamlining or "frills" such as a retractable undercarriage. They require a rugged, dependable aircraft that can be flown fully-loaded out of unprepared landing fields or off small lakes, in all weathers and with a minimum of maintenance, and that just about sums up the "Beaver."

It was designed as a 4-seater, but with a cabin large enough to accommodate a lot of bulky freight. As a result, when the prototype proved itself very much more efficient than its designers could have hoped, there was plenty of room for another three seats, and the "Beaver" is now authorized for operation as a 7-seater, with an all-up weight of 4,820 lb. It is an orthodox all-metal monoplane, powered by a 450 h.p. "Wasp Junior" engine, and can operate on wheels, skis, or floats.

"Beavers" are now being turned out at the rate of two a week. With typical ingenuity the Company's technicians have designed a three-wheeled trolley that fits loosely under the floats of "Beaver" seaplanes, so that these aircraft can be flown from the factory runways. This saves about £120 delivery charges on each machine, as well as a lot of time.

Present production is largely for Canadian charter firms and Government fire services, but the "Beaver" should also attract operators outside the Dominion.



The prototype Canadian-built D.H. "Beaver." Photograph by courtesy of de Havilland Enterprise.

A Fine Salvage Feat

Righting a Capsized Ship in Dock

By W. Barr

IN June last year the greatest salvage feat ever attempted by the Mersey Docks and Harbour Board successfully reached its first stage. The vessel concerned was the 7,938-ton "*Matrona*," which during the war had been employed as a hospital ship. This vessel was formerly the "*Aba*," and was well-known in the West African trade.

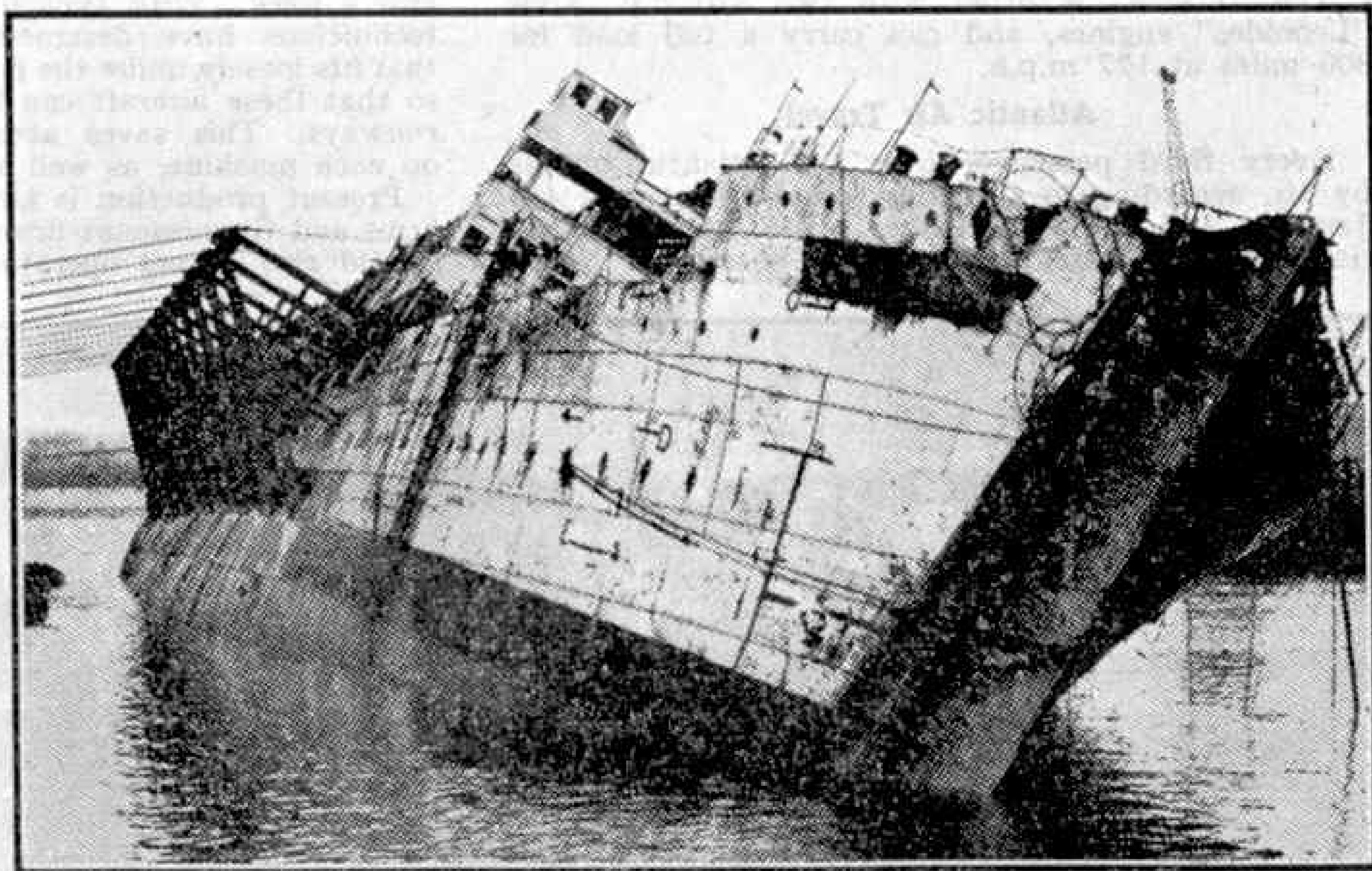
While in the Bidston Dock, Birkenhead, the "*Matrona*" had turned over on her side on October of the previous year. She lay on her port side, half submerged in 32 ft. of water and taking up valuable space in the dock that would otherwise have been available for cargo working. The first step in the salvage work that became necessary was to bring the vessel upright, and preparations for this went steadily forward from the time when she capsized. The funnel, mast, and life-boats and other gear were removed by divers in order to reduce the top weight, and openings in the hull were sealed. The men engaged in this work had to tunnel through the clay on the bottom to reach some of the port holes.

In preparation for bringing the vessel upright 14 giant tripods were welded on her starboard side, which was specially strengthened for the purpose. From these tripods 9 in. steel hawsers were taken to winches on the dock side, where a large concrete anchorage of about 3,500 tons was constructed to give solid ground for the pull to be exerted. This was necessary because the ground surrounding the Bidston dock is soft in nature. To aid in the lift water was pumped from some of the compartments of the vessel,

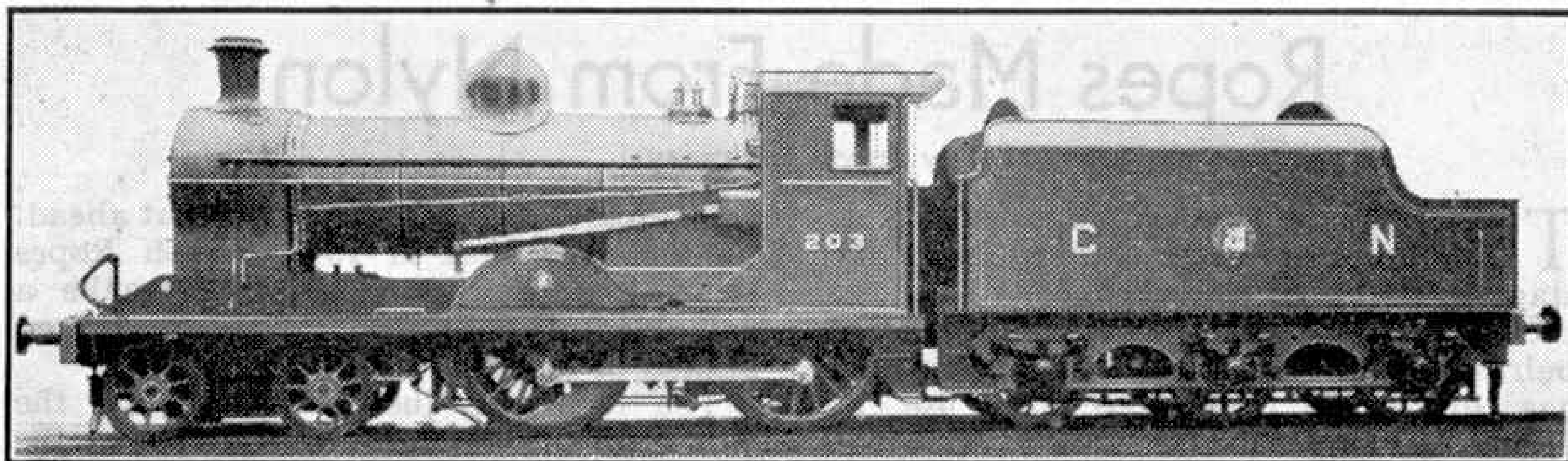
and in addition four camels or pontoons were placed on the port side of the vessel, and 7 in. wire ropes from these were taken under the hull and secured to the starboard side.

When the vessel was to be righted steam was supplied to the winches from five vessels moored in the dock. The winches exerted a pull of about 1,400 tons and as the ship gradually lifted she found her own centre of gravity and began to right herself. The flat side of the vessel lying on the mud gave rise to some suction, and this was overcome by pumping compressed air through open ports and also by the use of high power water jets to wash away the mud. A slight hitch occurred when two of the pontoons fouled the vessel, but these were soon cut away by acetylene burners and a quick short heave then raised the "*Matrona*" to the upright position.

After this had been done the vessel remained aground, because of water in her compartments, and this had to be pumped out in order to float her. While pumping the water out of the hull it was necessary at one stage to lower the level of the water in the dock by about 10 ft. in order to keep the vessel under complete control during these operations.



Righting the "*Matrona*" after she had capsized in Bidston Dock, Birkenhead.



G.N.R.(I.) new 4-4-0 No. 203 "Armagh" for branch line service. G.N.R.(I.) Official Photograph.

New Engines for the G.N.R.(I.)

THERE have recently been placed in service on the G.N.R.(I.) two new series of tender engines, each of which represents an interesting development of a class previously existing. Both lots of these new engines have been constructed by Beyer, Peacock and Co. Ltd., to the requirements of Mr. H. McIntosh, Mechanical Engineer of the G.N.R., to whom we are indebted for the details and photograph.

The engine illustrated is one of five inside-cylinder 4-4-0s, regarded as belonging to the already existing Class "U." The first engines of Class "U" were introduced in 1915 for long-distance branch and cross-country work such as on the section from Dundalk to Enniskillen, Bundoran and Omagh. Here the trains in general are light, but frequent stops are the rule, and there are many curving and sharply-graded lengths. For this reason driving wheels of the moderate diameter of 5 ft. 7 in. were adopted; and as weight restrictions were severe, special attention had to be devoted towards the production of fairly light yet powerful engines. So the boilers were rather small, but provision was made for mounting heavier ones later, should this be possible.

In the new engines detail improvements have been made to improve performance and handling, but wherever possible parts have been made interchangeable with the original series. A little more scope in design has been afforded by the raising of the permissible axle load since the original Class "U" engines were turned out. The cylinders have been re-designed to improve the steam performance of the engines, and in the layout of the frames it has been possible to introduce a fair amount of strengthening by the intro-

duction of steel castings. Similar improvements have been made in the bogie truck.

Hinged bottom doors to the ashpans and drop grates that can be operated from ground level are features that will help to reduce the time taken in disposal.

The tenders are of quite a new design and, together with the cabs now provided, follow more modern lines than the originals. Apart from these, the traditional outline of earlier classes is preserved. Six tons of coal are carried in each, and 2,500 gallons of water, and the tenders are equipped with roller bearing axle-boxes arranged for grease lubrication.

The new 4-4-0s, which are painted in the striking blue livery of G.N.R.(I.) passenger engines, are Nos. 201-205, named, respectively "Meath," "Louth," "Armagh," "Antrim," and "Down." This naming of a subsidiary class of engines is an interesting reversion to earlier G.N.R. practice when even the goods engines were named.

The second series of locomotives recently delivered are 0-6-0s of Class "UG," having the same boilers and tenders as those of the "U" class engines. These 0-6-0s are the latest development of the G.N.R.(I.) goods type following on the design of the original "UG" series, also of Beyer, Peacock build, of 1936. They have been considerably improved in detail in the same way as those of Class "U," and as far as possible details have been made common to both classes. The boilers, for instance, are interchangeable, also pistons, piston valves, slide bars and many other important items. The cab has been made larger.

The goods engines are Nos. 145-149, and they are painted black with red lines.

Ropes Made From Nylon

By Trevor Holloway

THE ancient craft of rope-making is entering upon a new and revolutionary stage in its history. Over 3,000 years ago the Egyptians were making ropes of bulrushes and camel hair. Since then man has gradually introduced the use of vegetable fibres such as manila, sisal and the like. These are what may be termed natural fibres. To-day ropes are being made from synthetic man-made fibres in the form of nylon.

The war necessitated urgent research in many fields of applied science, and the rope of nylon fibre was one of the results. In 1939 this synthetic material was just being

use, research and development went ahead. Thus it was that in 1943 British Ropes Limited were in a position to make a valuable contribution to a specialized branch of our fighting forces.

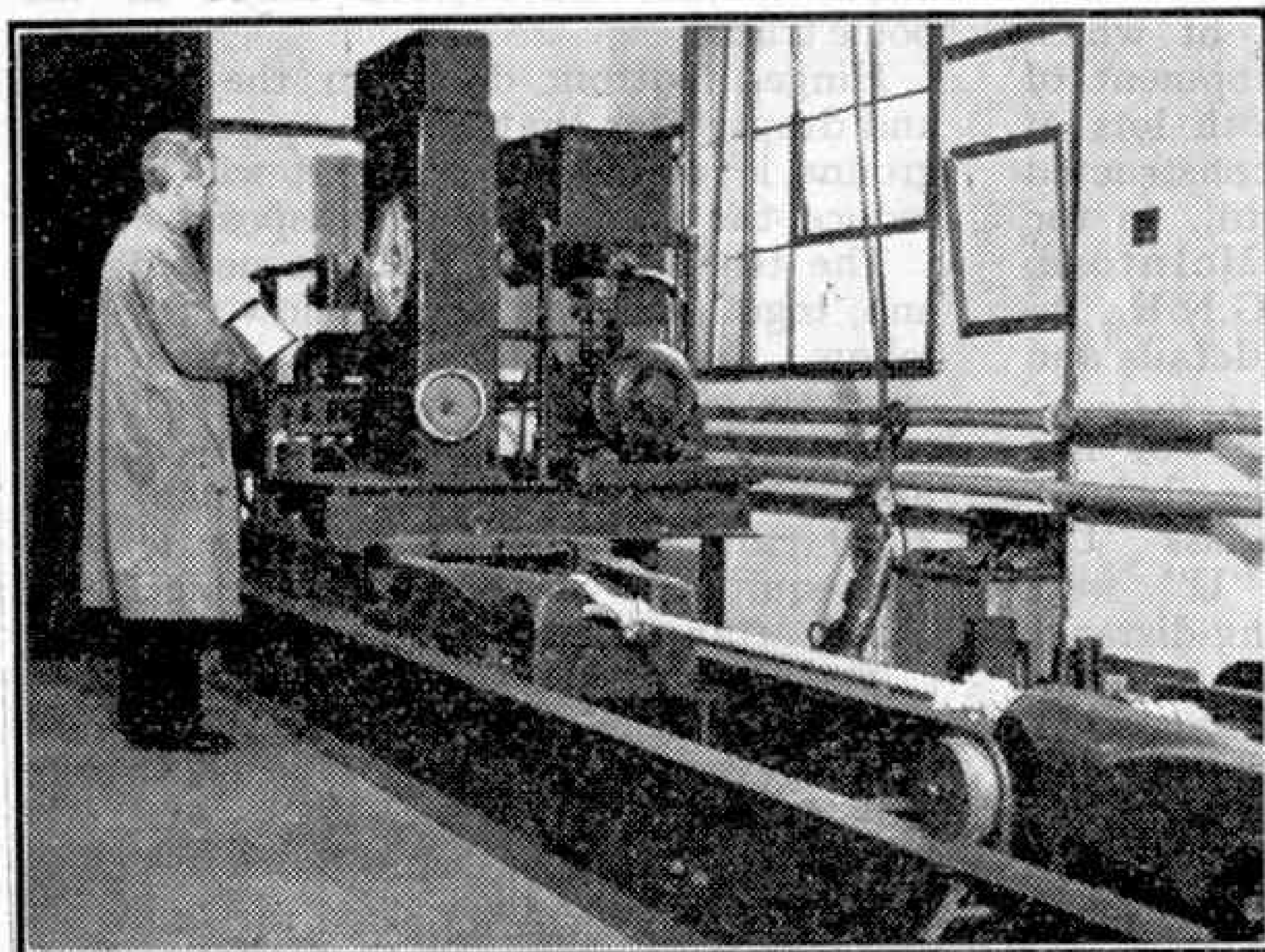
The firm had just completed for the Ministry of Aircraft Production large quantities of glider tow-ropes made from Italian hemp and manila. Admirable as these special-type glider ropes had proved to be, a new technique was being developed by the Aircraft Research and Development Department that seemed to require something even better. This involved the snatching of a loaded glider from the ground without the tug aircraft having to land. The operation demanded the use of an improved towing system, capable of withstanding the shock of high peak loads, but light in weight, so as not to stress unduly either the airframe or the glider.

This problem was passed to British Ropes on Friday afternoon, and by the following Monday the first complete nylon tow cable was ready for use. The Manager of the Leith factory flew in the first glider flight to observe the behaviour of the cable under operational conditions. So successful was this first flight, and so well did the new type of rope behave,

that contracts were immediately placed for bulk quantities. In the first instance the ropes were to be for pick-up work only, but later, when heavier type gliders were developed, for orthodox towing.

Towards the end of the war the United States Army Air Force also were being supplied. The feature that particularly won their admiration was the incorporation of a telephone cable in each strand, which allowed of intercommunication between the glider and the towing plane. Until that time, intercommunication cables were loosely affixed to the outside of the tow ropes, a practice that had many disadvantages, such as the trailing of loose loops.

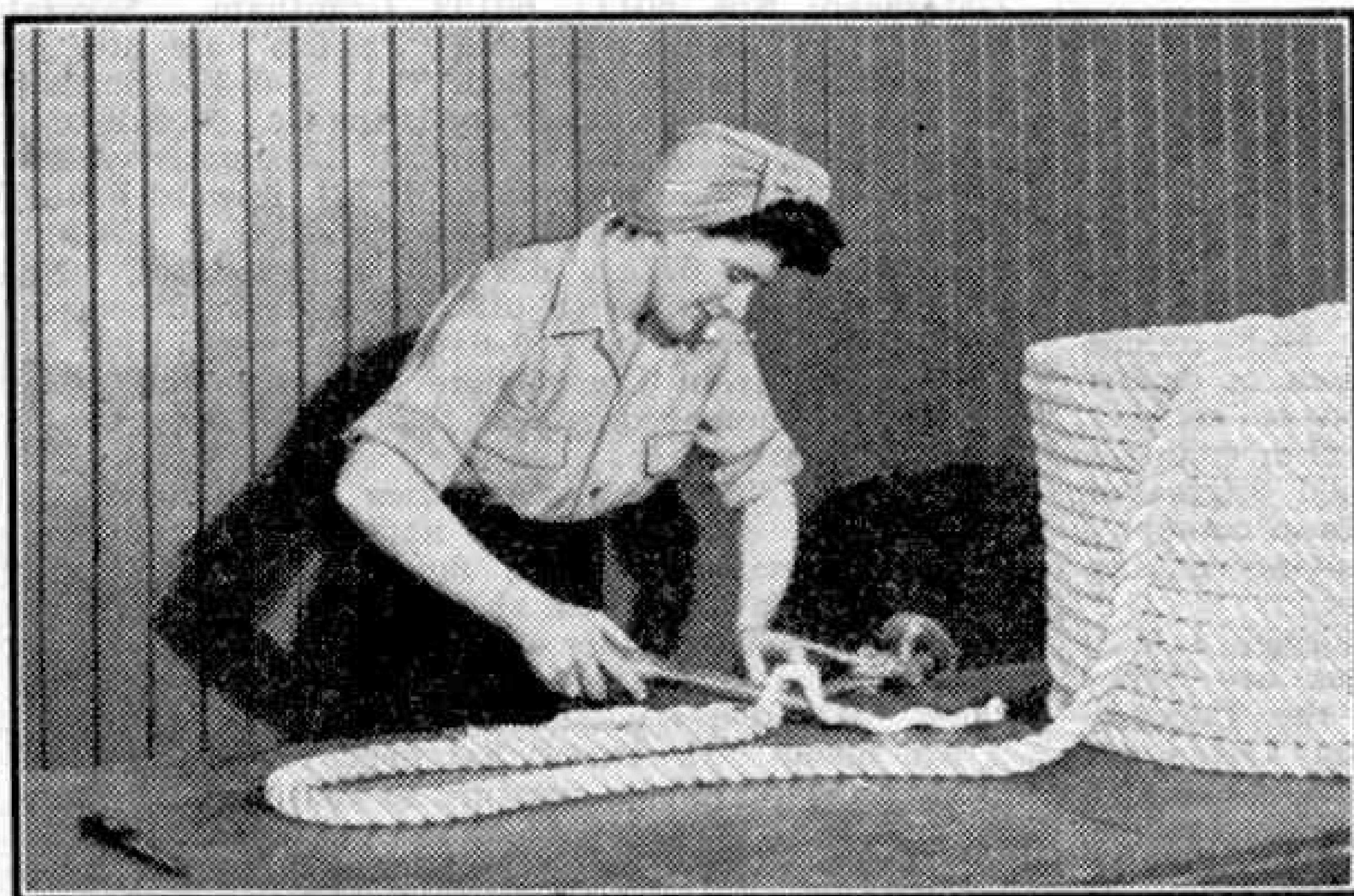
The Admiralty made much use of the



Testing nylon rope on a 30-ton tensile testing machine. Our illustrations are reproduced by courtesy of British Ropes Limited, Leith.

produced in large quantities, and the British Ministry of Aircraft Production were quick to appreciate the possibilities of the new fibre. Accordingly they approached the Leith Works of British Ropes Limited, the largest manufacturers in the country, with the suggestion that they would like the firm to investigate the question of nylon in relation to rope-making. It was soon apparent that here was an entirely new raw material in almost every way far superior to anything then in use. In short, the investigations strongly indicated that nylon was the rope fibre of the future.

Despite the fact that costs were high, and that only limited supplies of nylon could be made available for this particular



Splicing nylon ropes.

nylon ropes, as did also the Combined Operations Command, who issued them to Commando troops for use in mountain warfare and rock climbing.

Many advantages are claimed for this relatively new cordage. It has tremendous strength and great elasticity, and also is resistant to water, chemical action, rot and marine decay. In addition, it may be considered non-inflammable, and it is smooth, flexible and easy to handle. As may be expected, it has a beautiful silvery appearance, which completely belies its strength. It will not deteriorate in storage, even when wet, and it can be cleaned with soap and water.

The tensile strength of a nylon rope is almost double that of a rope of the same size made from high-grade manila fibre or Italian hemp. As regards weight and weight-strength ratio, for equivalent sizes of rope nylon can be regarded as being about of the same weight as manila, but as it is considerably stronger, it will support a greater load per unit weight. The following illustration may make this clear. A high-grade manila rope 3 in. in circumference, weighing 1.71 lb. per fathom, will give a breaking load of 5 tons; whereas a nylon rope slightly over 2 in. in circumference and weighing 0.84 lb. per fathom will provide the same breaking load.

Perhaps the most interesting features of the new rope are its extensibility and elasticity. In some cases the degree of extensibility under load is as

much as 40 per cent. above the original length before fracture. Its elastic properties are such that a nylon rope will recover to within 10 per cent. of its original length after the application of a load that is half of the ultimate tensile strength.

Ropes made from manila, hemp and other vegetable fibres are almost completely lacking in this characteristic. They can be stretched under load, but such stretch is mainly the result of the deformation of the component yarns and strands, and the slippage or fracture of filaments contained in

the rope body. Consequently the stretching of a vegetable fibre rope to any degree reduces the length of life of that rope and also impairs its reliability.

The technique of incorporating a telephone cable in a nylon rope will doubtless prove of great service in sea rescue work and marine salvage.

British Ropes Ltd. have recently installed an extremely interesting apparatus called a weatherometer for testing nylon and other ropes. This device is capable of producing "artificial weather" of almost any type desired, for with it temperature, humidity and light-intensity can be varied over a wide range. Tests made by this means may determine in a period of days or weeks the rate of deterioration which would occur in normal conditions during months of exposure to sun, rain and cold.



Nylon glider tow ropes. The larger rope on the left is for marine towing.

Railway Notes

By R. A. H. Weight

National News

In order to simplify supervision and reduce administrative costs, certain lines, stations or depots are being transferred from one Region to another in order to bring them into a more logical or compact area. In most cases the lines concerned originated as competitive penetrations by one railway company into the territory of another, often involving running power and joint operating arrangements.

For example: all sections of the former L.M.S. Railway in South and Central Wales are being transferred to the Western Region; the London, Tilbury and Southend section, including Tottenham to Barking, from L.M. to E. Region which operates all other railways in Essex; Carlisle-Silloth branch, at one time worked by the Scottish North British Company in England, also Canal Engine Shed, Carlisle, go into the L.M.R. orbit, as will some of the outlying ex-L.N.E.R. stations in West Lancashire and Cheshire; the Great Western Newbury-Winchester line is transferred to the Southern Region. This will not necessarily involve any immediate change in the locomotives or rolling stock employed.

The important through stations at Bristol (Temple Meads) and Worcester (Shrub Hill) will be controlled by the Western Region, abolishing the long-standing joint supervision by the "Midland" though L.M.R. trains will continue to run in, particularly at Bristol.

The Connel Ferry Bridge

By courtesy of Mr. H. M. Madgwick we are able to illustrate the fine and unusual cantilever bridge in the Western Highlands which carries the single branch line from Connel Ferry to Ballachulish across Loch Etive. The only road for many miles across the loch runs alongside the railway over the bridge under very narrow limits, a toll being levied on vehicular traffic by the railway authorities. Owing to the lack of clearance space, road vehicles cannot cross while a train is on the bridge.

The bridge is set amid superb scenery at a height of 50 ft. above high water, with a clear space of 500 ft. between the piers. It was a fine piece of engineering when opened in 1903, containing some 2,500 tons of steelwork, being owned in its early days by the Caledonian Railway.

Eastern and North Eastern Regions

A contract has been placed with a famous Clydebank firm for the construction of another twin-screw, oil-fired, geared turbine ship for the Harwich-Hook of Holland service, similar to the "Arnhem" completed in 1947, to replace "Prague" which became a total loss as the result of fire last year. The new vessel will be a small "Liner" in every respect, carrying 500 passengers in cabins.

New "A1" 4-6-2s continue to come into service from Doncaster and Darlington Works rapidly. Recent allocations at the time of writing include Nos. 60120, 60130-1, King's Cross; Nos. 60118-9, 60134, 60136, Copley Hill, Leeds; Nos. 60132, 60135, 60137,

Gateshead; Nos. 60117, 60133, Grantham. Several of the "A2" smaller-wheeled "Pacifics" are now at Peterborough main line shed. "L1" 2-6-4Ts finished in lined black are also appearing in considerable numbers from the North British Locomotive Company's plant numbered from 67731 upward. Nos. 67731-2, 67737-8, 67743-4 are stationed at Hitchin; Nos. 67733-6, 67741, 67745-6 at Stratford; No. 67747 at Neasden, with others coming into service. Some "N2" and "N7" 0-6-2Ts are being tried on local workings in Lincolnshire and may well prove faster and more economical than the elderly tender engines they replace.

Of the 10 "C1" G.N. "Atlantics" remaining on the active list, one has been nationally renumbered 62885. Survivors of this famous class were still working from Grantham shed quite recently. Withdrawals of various older engines continue; two former Metropolitan classes are extinct; "L2" 2-6-4 goods tank; "M2" 0-6-4 passenger tank.

No. 60068 "Sir Visto" has been rebuilt to "A3" standard with 220 lb. pressure so that there are now no 180 lb. Gresley 4-6-2s of the original "A1" type, afterwards styled "A10." No. 60074, "Harvester" has been in works for general overhaul, emerging again painted experimental blue with red, cream and grey lining.

Among good runs lately reported were the 4.10 a.m.



London Midland "6P" 4-6-0 No. 45540 "Sir Robert Turnbull" passing Berkhamsted with a Wolverhampton train. Photograph by H. C. Casserley.

from King's Cross which covered the 44½ miles Hitchin to Peterborough start to stop in about 42 min. with "10 on," hauled by "A3" No. 60050, "Persimmon," so arriving well ahead of time; "A2/1" No. 60508, "Duke of Rothesay," now painted green, arriving King's Cross 9½ min. early with the 1.49 p.m. Sunderland, Saltburn and York express; similar or rather greater time recovery by the southbound "Yorkshire Pullman" headed by "A1" No. 60134 from Leeds; the relief portion of the up "Flying Scotsman," starting at Newcastle, a 470-ton train worked by "A3" No. 110, "Robert the Devil," gained 12 min. south of Grantham, reaching London 9 min. early; "A4" No. 22, "Mallard" with a similarly-loaded up Leeds express made up 11 min. from Stoke summit although closely following a heavy train hauled by a "V2" 2-6-2. There are some commendably fast timings in the N.E. Region between Darlington and York where sustained speeds often are higher than now usual on many parts of the former G.N. main line.

The King's Cross-Cambridge buffet car expresses, intermediately serving Welwyn and Letchworth Garden Cities, also Hitchin, which were such a popular

pre-war feature, were restored in December last, worked chiefly by "B1" 4-6-0s. Heavy fish traffic from East Anglian ports brought many 2-6-0s to the Yarmouth and Lowestoft area.

London Midland, and Scottish Regions

An appreciation reaches us of the extremely clean and well-kept appearance of the Class "5" and "5XP" 4-6-0s stationed at Bristol, 22A shed. Some of the latter are still painted red and work through to Derby, Sheffield and elsewhere.

Class "5" No. 44811 of Saltley shed, Birmingham, hauling an 8-coach Manchester-Bournemouth train was logged from Gloucester to Bath and gave a good run, recovering $4\frac{1}{2}$ min. After leaving the main line at Mangotsfield N. Junction, the rather remarkable speed of 80 m.p.h. was attained on the secondary Midland line to Bath near the foot of a sharp descent past Kelston.

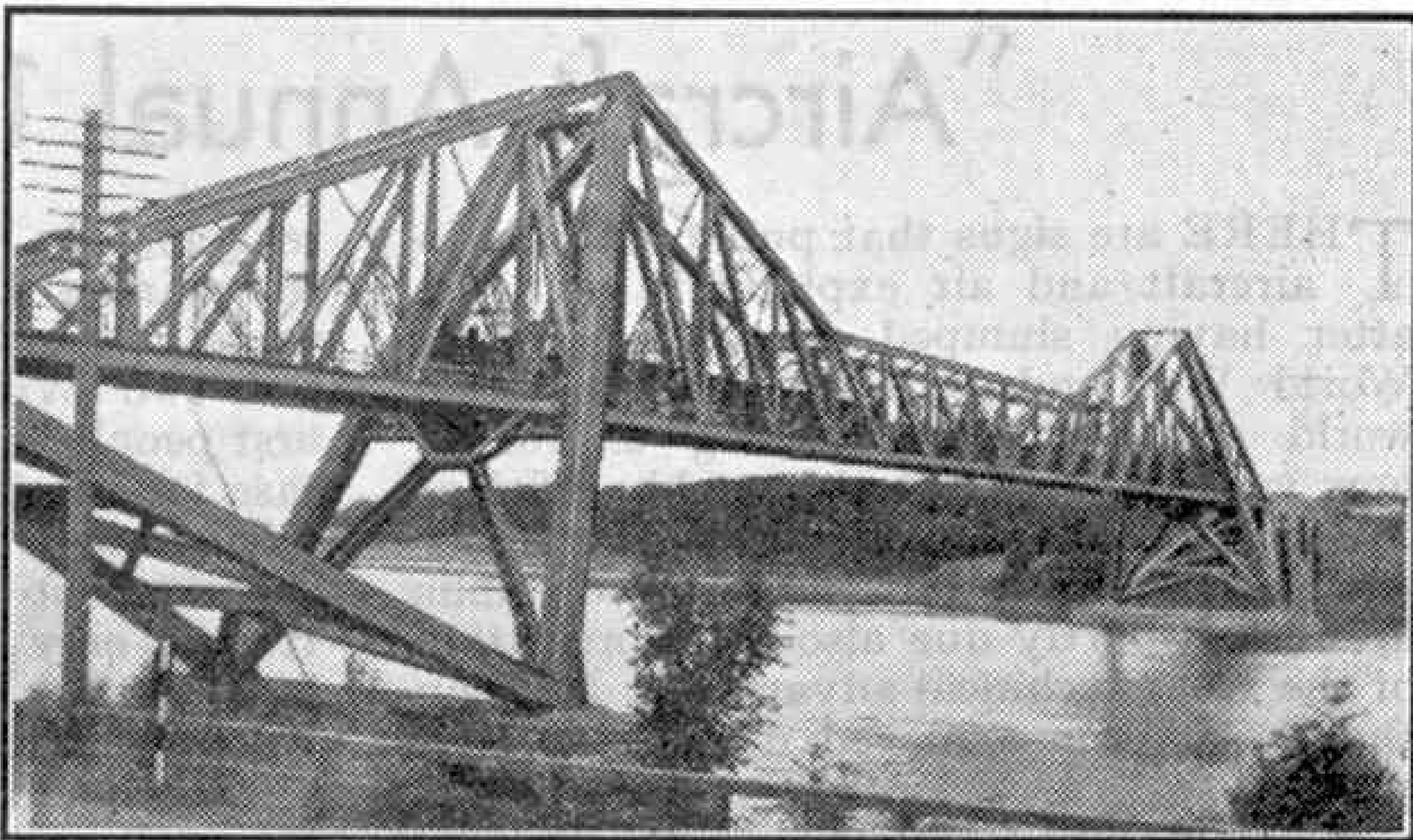
No. 45523 is now "6P" converted "Patriot" 4-6-0. All the unsuperheated "Dunalastair" 4-4-0 engines of Caledonian origin have been withdrawn, though some remain as superheated members of class "3."

New engines have been placed in service and allocated as follows: 2-6-4 class "4" mixed traffic tank Nos. 42175-6, 27B, Greenock; 42177, 17A, Derby; 42178, 24C, Lostock Hall, Lancs., 42179, 23D, Wigan. "2F" 2-6-0: Nos. 46420-4, 8D, Widnes; 46425-7, 3A, Bescot. Class "5" 4-6-0: Nos. 44713-7, 5A, Crewe North.

Certain intermediate types of locomotives are now designated "Mixed Traffic," such as the 2-6-2 and 2-6-4T; the new lighter 2-6-0s now coming into service, as well as the "5F" 2-6-0s of the "42XXX" series; and the Webb 0-6-2T engines now "2PT."

Western and Southern Tidings

New engines built at Swindon include: 4-6-0 Nos. 6991, "Acton Burnell Hall"; 6992, "Arborsfield Hall"; 6993 "Arthog Hall"; 6994 "Baggrave Hall"; 6995 "Benthall Hall"; 2-6-2T, Nos. 4168-9, and 0-6-0T, Nos. 6760-4. Many engines are now being



Connel Ferry bridge, the second largest cantilever bridge in the British Isles. It crosses Loch Etive and is situated on the ex-L.M.S. Ballachulish line. Photograph by H. M. Madgwick.

turned out in lined black and some of freight or shunting types are in plain black. Most of them are without lettering, which also applies to some Southern Region engines. Several more "Castle" and "Hall" class 4-6-0s have been converted back from oil to coal burning. As usual during periods of heavy traffic, all classes of 4-6-0, together with some 2-6-0 and 4-4-0 engines, played their part in handling the large number of additional Christmas trains.

Turning now to the Southern Region, we learn that new "Merchant Navy" locomotives are being completed in quick succession at Eastleigh, Nos. 35027-8 being nearly ready at the time of writing. Nos. 35023-4 are stationed at Exmouth Junction, Exeter; new "Battle of Britain" light 4-6-2s, 34083-4 are at Stewarts Lane, London, 34086 (light green) at Ramsgate. There has been some further adjustment among "West Country" engines allocated to Brighton and Salisbury sheds respectively. "F1" class Stirling 4-4-0s are seen on Reading-Redhill trains, probably their last area of service as regular passenger engines. This important cross-country line still presents an interesting variety of motive power. A good many more engines have been withdrawn from the stocks of the former three constituent companies which formed the S.R.

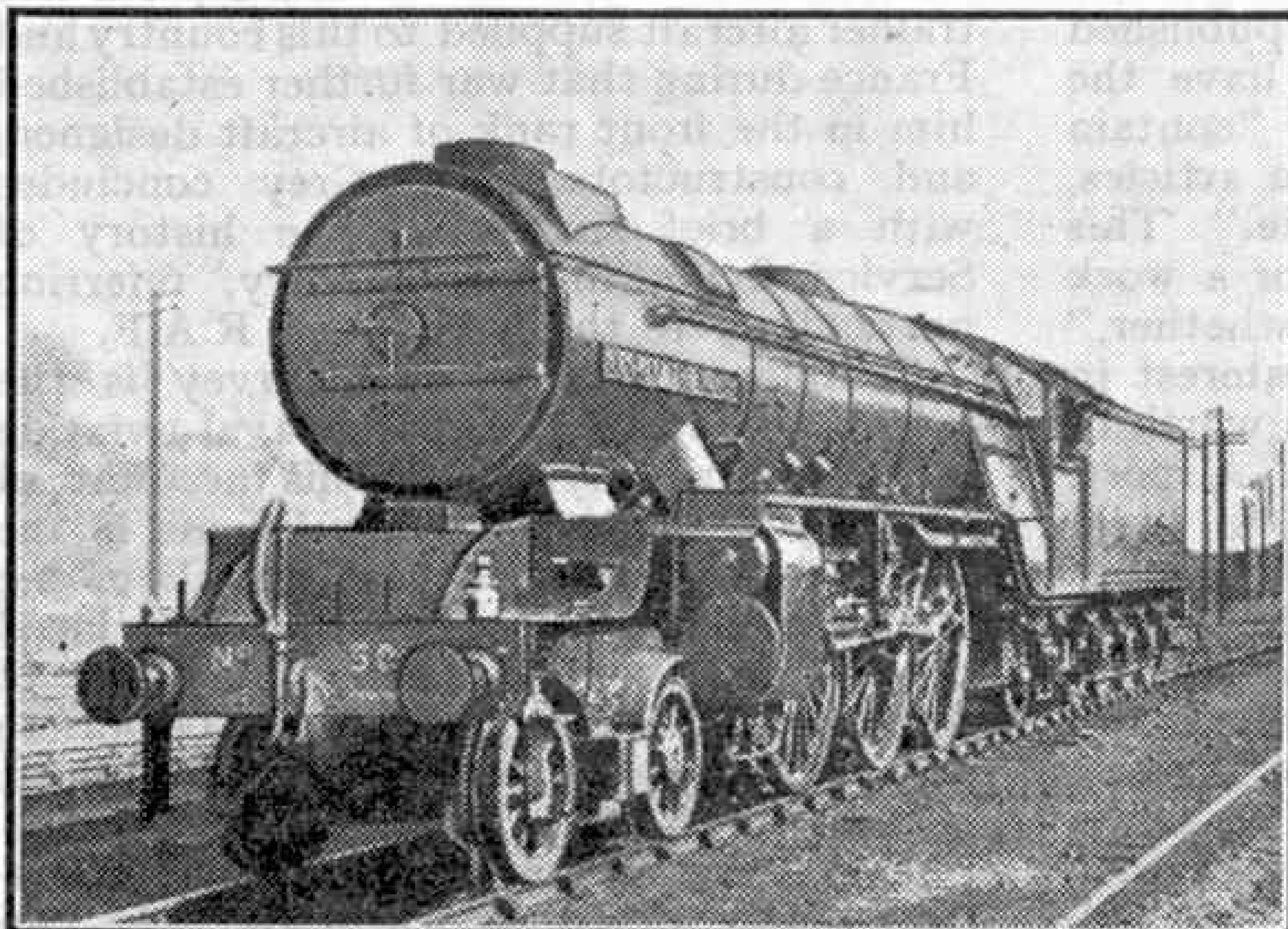
The Kent and East Sussex line is now part of the Ashford running district, while the old East Kent Railway (now freight only) comes under control of Dover shed.

Gas-Turbine Progress

The Brown-Boveri gas-turbine electric locomotive, ordered by the former G.W.R. in 1946, is now reaching an advanced stage of manufacture, and it is anticipated that it will be delivered to British Railways in July this year.

Construction of both the power unit and chassis is in progress. Bench tests of the power unit should take place towards the end of next month and load trials of the complete locomotive on the Swiss Federal Railways in June.

The power-unit for the gas-turbine locomotive undertaken by the Metropolitan-Vickers Electric Company, at Manchester, in conjunction with British Railways (Western Region), is also well advanced, and progress has been made with the design of the mechanical parts.



"Cock O' The North," originally a 2-8-2 of the former L.N.E.R., now converted to a 4-6-2 of Class "A2/2." Photographed at Aberdeen by P. L. Melvill.

"Aircraft Annual 1949"

THERE are signs that public interest in aircraft and air exploits is reviving, after having slumped when the second World War ended. Continued unsettled world conditions are making us realize how very important a thoroughly efficient Air Force is as the first line of defence against aggression, but the renewed public interest is partly due also to appreciation of the great technical advances in aviation that have been achieved during the past year or so.

Some of these developments are recorded in * "Aircraft

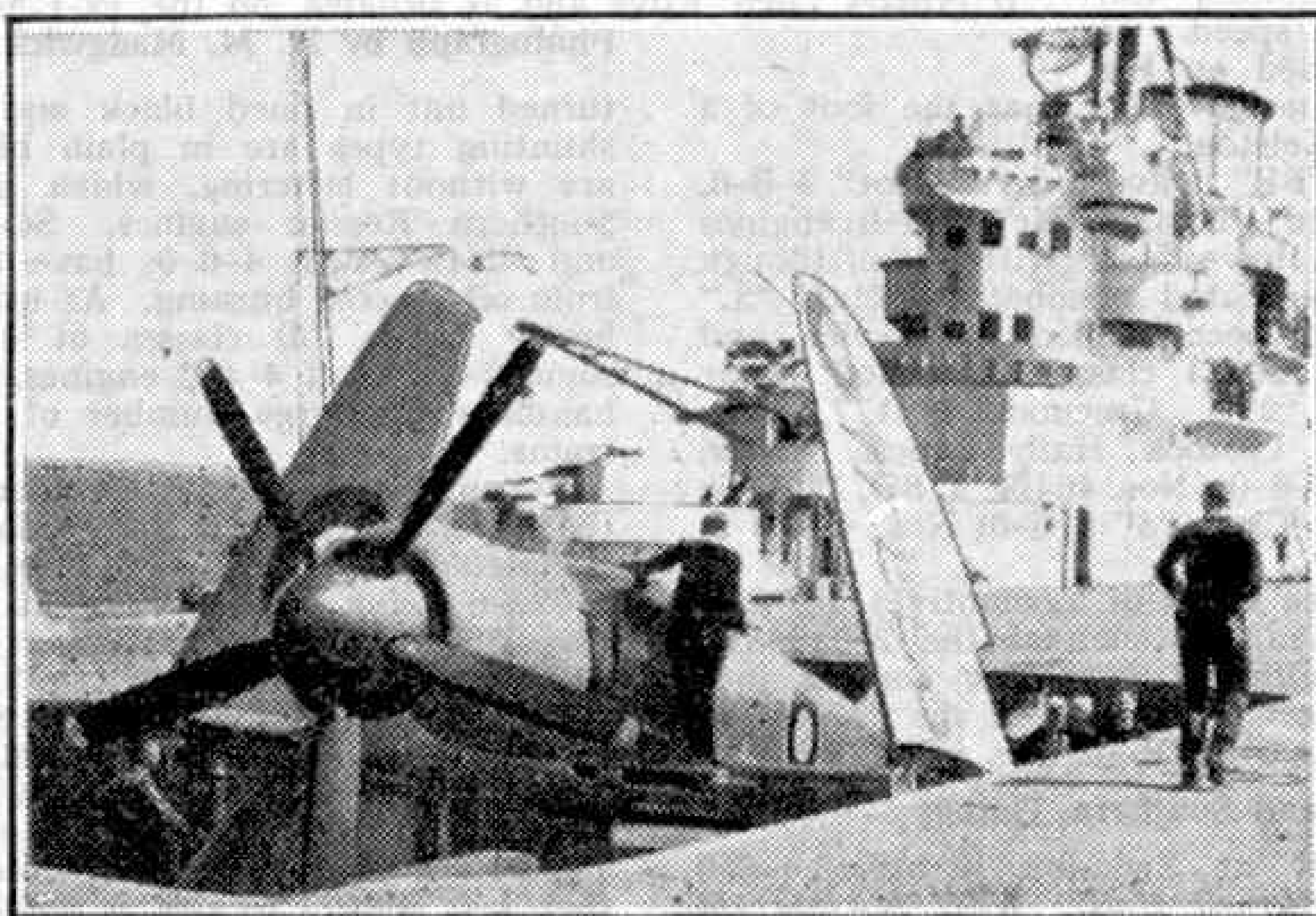
Annual 1949"* just published under the editorship of John W. R. Taylor. Mr. Taylor does not need any introduction to "M.M." readers, as his aviation articles and "Air News" have been a popular feature of the Magazine for several years past. The title

indicates that the book is to be published yearly, and it is gratifying to have the Editor's assurance that it will "contain only the best and most accurate articles, and the finest pictures available." This is a very high standard to set for a work designed to cater for everybody, "whether," to quote the Foreword, "your interest in aircraft is confined to a shilling's worth of the public enclosure at London Airport, whether you fly, fly in or help to build aeroplanes." The first number measures up well to this standard, for the names and experience of the contributors testify to the accuracy of the text, and the many half-tone pictures are excellent.

The opening article is by C. G. Grey, who has been "in aviation" since its early days, and is also well known to "M.M."

readers. In his candid racy style he summarizes the history of aviation, and while acknowledging the achievements of the two Wright brothers in being the first people to fly, he puts forward a strong case for greater recognition of the splendid pioneer work of that other American, Glenn Curtiss, who commenced flying in 1908. It was only one year later that Curtiss beat Bleriot in the Gordon Bennett Cup Race at Rheims, and in 1910 a Curtiss biplane made history by being successfully flown off and on to a platform erected on

the deck of a warship. Curtiss turned his attention to designing and building flying boats, and in the 1914-18 war dozens of twin-engined Curtiss boats were in service with the Royal Navy on anti-submarine patrol. The large number of Curtiss biplane



A Hawker "Sea Fury," with wings folded, being brought up from the below-deck hangars of H.M.S. "Illustrious." (One of the illustrations in "Aircraft Annual 1949" reviewed on this page).

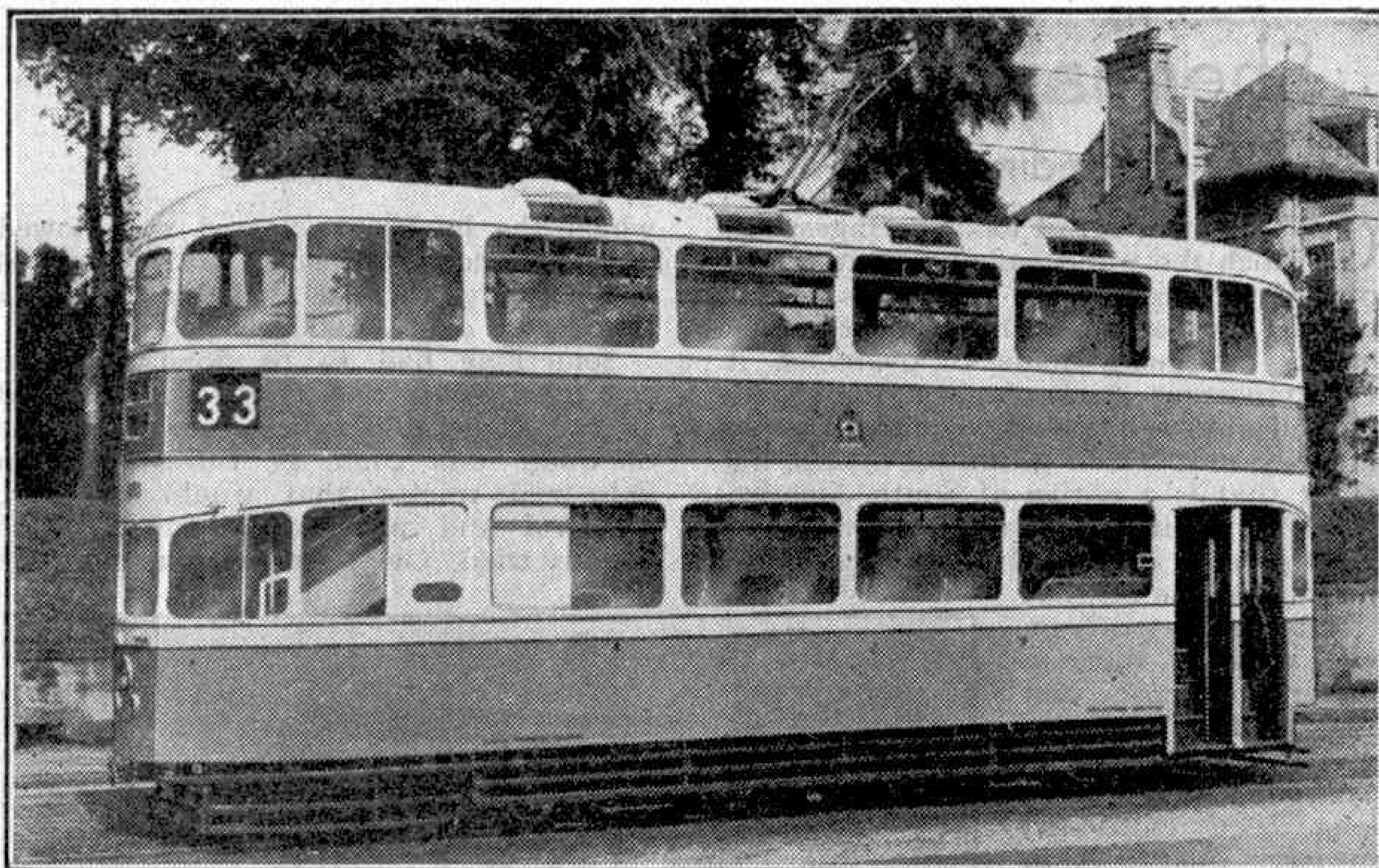
trainer aircraft supplied to this country and France during that war further established him in the front rank of aircraft designers and constructors. Mr. Grey concludes with a brief survey of the history of Service flying in this country, referring particularly to the R.F.C. and R.A.F.

Complementary to this survey is the fascinating story of British naval aviation told by Mr. Taylor. In his account of the Royal Navy's air achievements in the 1914-18 war he recalls those early bombing and torpedoing successes that convinced the Admiralty of the offensive value of ship-based aircraft, and thus began to prepare the way for the great aircraft carriers of to-day.

This is the age of transocean and trans-continental air transport. Last year Pan American World Airways celebrated their 21st birthday, and a special chapter in this book tells the

(Continued on page 84)

*"Aircraft Annual 1949" edited by John W. R. Taylor. Published by Ian Allan Ltd., 33, Knollys Road, Streatham, London S.W.16, price 8/- post free.



Glasgow's New Tramcars

Speedy Transport in Comfort and Safety

GLASGOW has long been famous for its fleet of comfortable and efficient tramcars, and no effort is being spared to keep the city well to the forefront in this respect. Before the war the Transport Department designed and built in its own workshops 100 new tramcars for the Empire Exhibition held in Glasgow in 1938. These were known as the "Coronation" type. A further 50 were completed in 1940, and then further modernizing of the fleet was brought to a standstill by the war.

As soon as possible after the war a very fine experimental tramcar was built in Glasgow. This was illustrated and described in the "M.M." for February of last year. Now a start has been made with the construction in the Transport Department's works of 100 new tramcars that retain the best features of the "Coronation" car. The experience gained in the building of the experimental car already referred to also has been helpful in designing this latest luxurious type, which provides speedy transport in comfort and safety.

The new vehicle is a handsome one, as can be seen from our illustration, reproduced by courtesy of Mr. E. R. L. Fitzpayne, General Manager, Glasgow Corporation Transport. The lower saloon seats 30

passengers and the upper saloon 40. The seats are made of steel tubular frames fitted with Dunlopillo cushions. Those in the upper saloon are trimmed with leather, the colour scheme being red with green bandings. The lower saloon seats have moquette coverings with leather bandings, and the ceiling of this saloon is in colours to blend with those of the seat moquette. The floors are covered with cork tiles. Rubber cushions fitted to the edges of the doors prevent draughts and safeguard against accidents, and another interesting feature that our illustration shows is the provision in the upper saloon of roof lights made of Perspex.

The platform doors are folding, and provision has been made for fitting gear for operating them by means of compressed air. The first tramcar built is not equipped in this manner, but experiments are to be made with the system, and if these are successful it will be applied to all new vehicles. There are three steps from the street to the floor of the lower saloon, which is at the same level throughout the vehicle, and the fitting and spacing of hand rails has been carefully considered in the interests of safety. Route numbers can easily be read from the pavement.

Sherman Tank to Shervick Tractor

Speeding the African Ground Nut Scheme

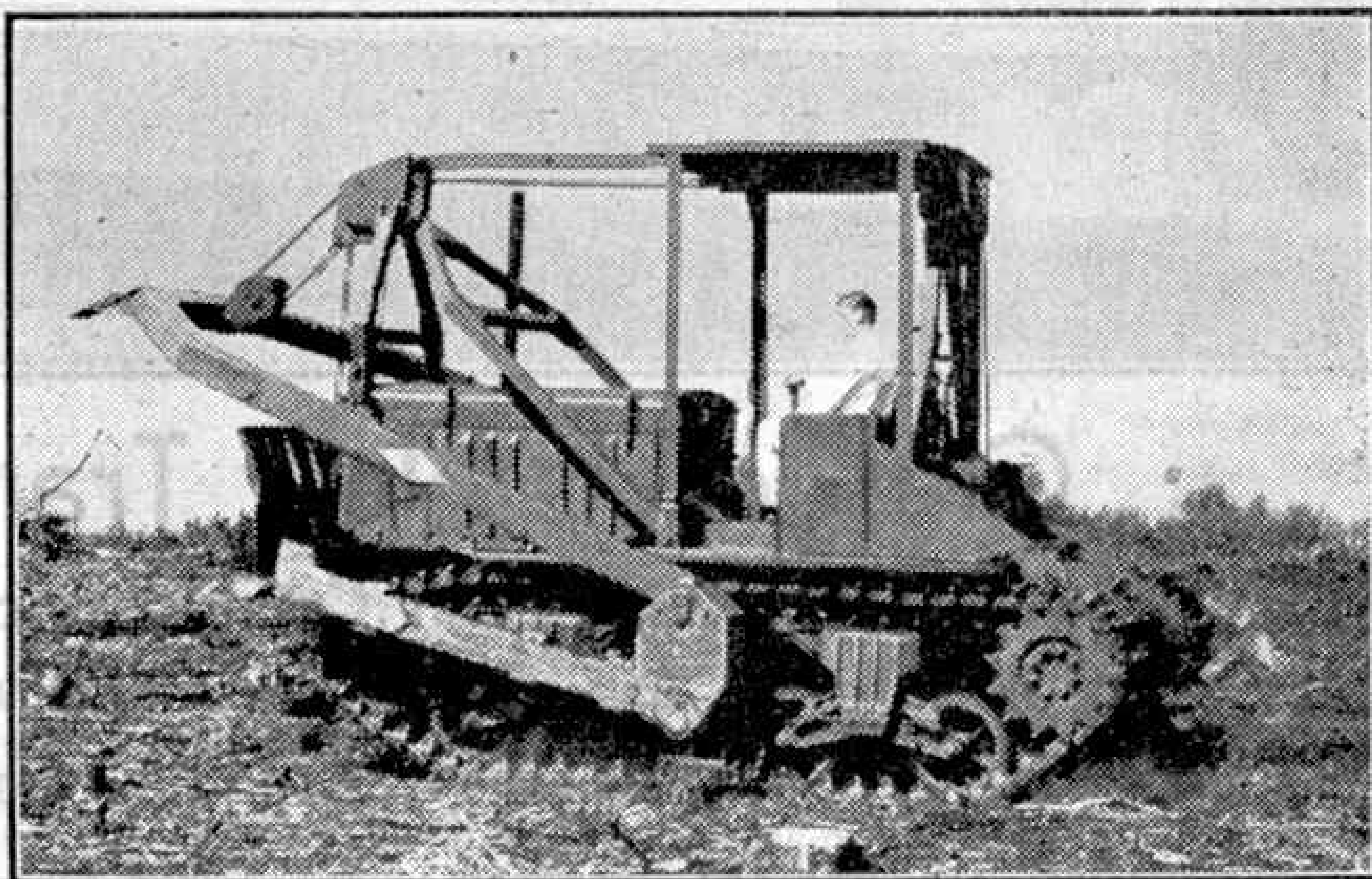
ONE of the greatest food shortages from which the world suffers to-day is lack of sufficient edible oils and fats. This is causing special concern, and determined efforts are being made to overcome it. One important source of oils and fats is the ground nut, well-known to children as the monkey nut, which grows on a bean-like plant that is a native of South America. The peanut itself is found a few inches underground, not on the branches of the plant; and the oil that can be extracted from it is of great value in making margarine and cooking fats, and also soap.

Ground nuts have long been cultivated in large quantities in India and in West Africa, as well as in various parts of America, but to-day India needs all her own production, and lack of locomotives and other difficulties have slowed down the export of African ground nuts. A plan to extend the area of cultivation therefore was suggested in 1945 by the United Africa Company, and has been put into operation by the British Government. The scene of these activities is Tanganyika, in East Africa, a former German colony that came under British mandate at the end of the first world war. There an immense area of ground has been marked out for clearance, a railway has been built and other lines are projected, and the ports of the country are being extended to cope with the heavy traffic that the scheme will involve when in full operation.

The first area to be cleared was around Kongwa, about 240 miles inland from Dar-es-Salaam, the chief port of Tanganyika, and for this purpose tractors left over after the war were shipped to Tanganyika. But the Kongwa thorn bush, which grows to a height of 10 ft. or so, has tough stems and roots that defied the efforts of the machines first used. Break-downs were numerous, and the rate at

which the land was cleared was slowed down so much that instead of the expected 150,000 acres of land available in a year there were only 15,000 acres.

Something had to be done to make clearing quicker and more effective, and at this stage it was suggested that the Sherman tank could be turned into an industrial tractor that would be more powerful and more robust than those already tried. One of these tanks therefore



The Shervick tractor at a demonstration of its power on rough ground near Camberley. The illustrations to this article are reproduced by courtesy of Vickers-Armstrongs Ltd.

was sent to the works of Vickers-Armstrongs Ltd. at Chertsey. There it was examined, and a scheme was worked out for its conversion from the warlike use for which it was planned to the happier task of helping to provide more food.

Three months later the first model was completed and began its trials. Shortly afterwards two converted Shermans demonstrated their powers so convincingly near Camberley that a regular scheme for the conversion of more Sherman tanks to peaceful purposes was put into operation. One of them, fitted with a curved plate similar to that of a bulldozer, swept away the stumps of huge trees, and the immense curved knives of a Blaw Knox root-cutter towed behind the second tore irresistibly through the underground roots of tree stumps. This tool combines the action of a disc plough with that of a ripper. The roots themselves afterwards were dragged

out of the ground by a 16 ft. rake with teeth more than a yard long. Even living trees did not halt its progress, for it was armed with a tree dozer, a heavy metal blade carried at the ends of long arms that pushed large trees over at a steep angle as the tractor surged forward. After this each stump could be torn out of the ground by the curved plate, which penetrated under the trunk and heaved the entire tree out of the ground.

This new weapon in the world's food campaign is called the Shervick tractor, a name that is an apt combination of that of the tank from which it is made and the name of the firm carrying out the conversion. In this the tank is completely dismantled, and all parts are inspected, cleaned and overhauled. A completely new frame is then made. This has the shape of a punt, with cross members of box section at the front and in the centre. The centre cross member is extended on each side, ending in heavy square flanges to which the arms of the tree dozer and stumper are welded.

The Shervick uses the crawler tracks of the tank, with some modifications, but only one of the two six-cylinder diesel engines fitted to the Sherman is included in the Shervick design. This means that



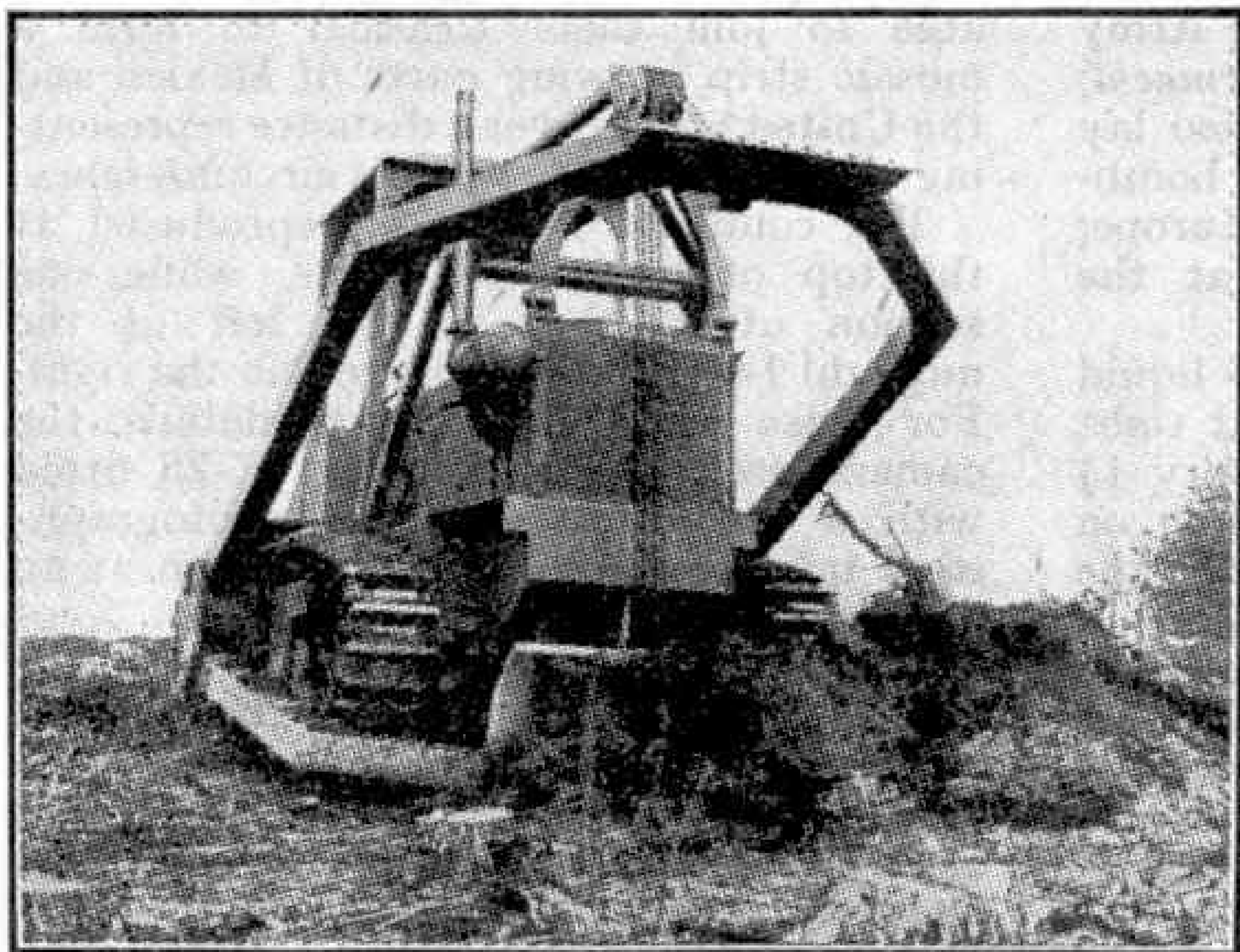
The stumper of a Shervick at work on a tree that has been partly uprooted by the tree dozer.

a pool of spare engines is being built up, so that engine breakdowns will not cause loss of valuable time. A new engine can be fitted into a tractor without delay when the old one requires overhaul. The speed of the engine, which is of the two-stroke type, is governed at about 1,500 r.p.m., at which it develops 165-177 b.h.p.

A standard General Motors clutch is used, with a few necessary modifications. The complete gear box unit of the Sherman is retained, but only four forward gears and the reverse are generally used. The forward gears give operating speeds up to $7\frac{1}{2}$ m.p.h. at the engine speed of 1,500 r.p.m.

The Shervick presents an impressive appearance, with its giant radiator and bonnet, the stumper and tree dozer mechanisms, and the exhaust pipe raised high to carry fumes clear of the driver. The whole tractor is 15 ft. long and 9 ft. wide, and it weighs $18\frac{1}{2}$ tons with a tree dozer fitted, $15\frac{1}{2}$ tons without. The driver's seat is of double width, and track guards and radiator guards are fitted.

The conversion of the Sherman tank into an agricultural tractor is a strikingly liberal example in modern form of turning swords into ploughshares. Reports on the performance of the first Shervicks to be used in Tanganyika show that they have proved equal to the task for which they were designed.



Front view of the Shervick, showing the stumper in action, with the tree dozer above it.



Photography from 300,000 Feet

Earth's Surface Recorded by Rocket Camera

By John W. R. Taylor

"FIVE four three two NOW."

At the touch of an electric button the giant V2 rocket burst into life, white-hot gases blasting from its tail with an ear-shattering roar. At first it rose so slowly that it seemed it must topple over. Then suddenly it shot up, accelerating so quickly that it was lost to sight in a moment, leaving only a white vapour trail against the deep blue sky.

That scene was repeated time after time in Western Europe before VE-Day, but this time there were differences. The officer who pushed the button wore the khaki uniform of the United States Army instead of the field-grey of the *Wehrmacht*; the white desert sand of New Mexico lay beneath the rocket instead of the bomb-scarred coast of Hitler's Fortress Europe; and this rocket was not aimed at the heart of the British Empire.

From its slim body, between two liquid fuel tanks, a camera pointed out at right angles to the line of flight, and every $1\frac{1}{2}$ seconds the shutter clicked, recording on film everything within range of the special lens.

After a little more than a minute the rocket's power was exhausted and, 60 miles above the Earth, it gradually lost its momentum, until finally it spun slowly over and began to hurtle down again. During those few seconds at the peak of its climb the rocket's camera took one of the most amazing series of photographs ever recorded.

On the ground, scientists followed the path of the rocket on radar screens, and after it had dropped 36 miles they detonated by radio an explosive charge which blew the camera clear. When it was recovered three days later the camera was little worse for its ordeal; its shutter still worked and the film was undamaged.

When developed, the film was found to contain more than 240 photographs taken at various heights, the most important being the series of 16 negatives exposed when the lens swept along 2,700 miles of the horizon as the rocket changed direction at the peak of its flight. Experts were able to join them together to form a mosaic strip showing parts of Mexico and the United States over a distance representing one-ninth of the world's circumference.

The complete mosaic is reproduced at the top of these two pages, while one section of it—that to the left of the numeral 1—is shown enlarged on the right. For those who like technical details, the camera used was a modified K-25 fitted with a red filter; and the photographs were taken on Aero Super XX film at an exposure of $1/500$ th second.

It would be wrong to suggest that the sole purpose of the present series of American rocket experiments is to obtain small-scale photographs of Mexico and the Southern United States. On the contrary, the chief concern of the U.S. Army and Navy is to produce a successful guided missile capable of delivering a knock-out atomic blow quickly and

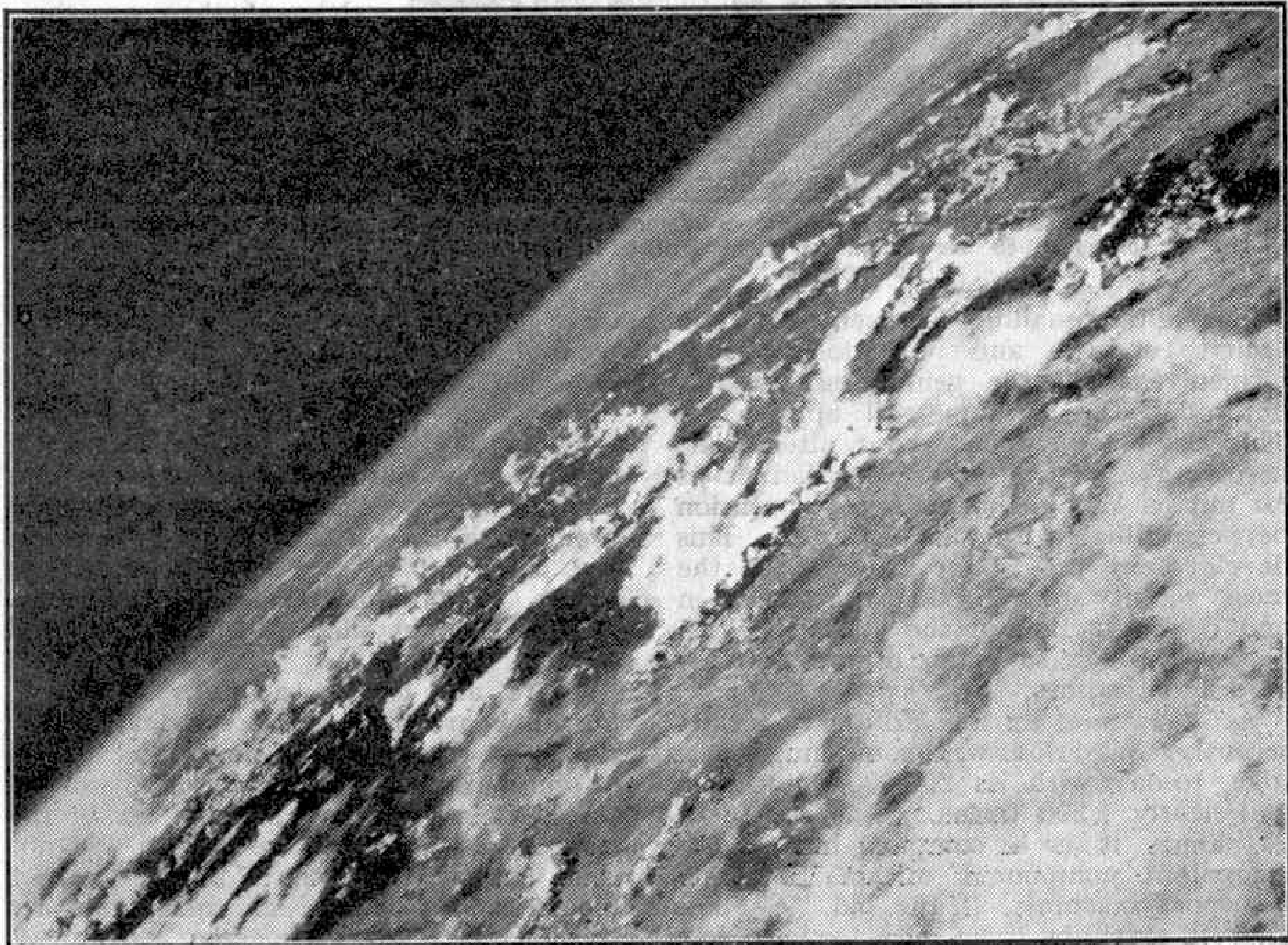


precisely to any aggressor nation." But when additional scientific information, like these photographs, can be obtained without interfering with the basic test programme, this is encouraged. On this occasion the V2 carried also instruments to collect cosmic ray and meteorological data, installed by scientists of the Applied Physics Laboratory of Johns Hopkins University, Maryland, under a U.S. Navy contract.

The additional information often has great possibilities from the military point

of view. For example, the success of this trial photographic flight proved that, if an efficient method of controlling rocket flight could be evolved, missiles could be used to obtain reconnaissance photographs of enemy territory, without risk to human aircrew.

It will be many years before such "push-button" missiles become a military possibility, for the Americans have not yet released details of a rocket of their own design even as good as the German V2 described in last month's "M.M."



A Visit to "Waterloo Box"

By "North Western"

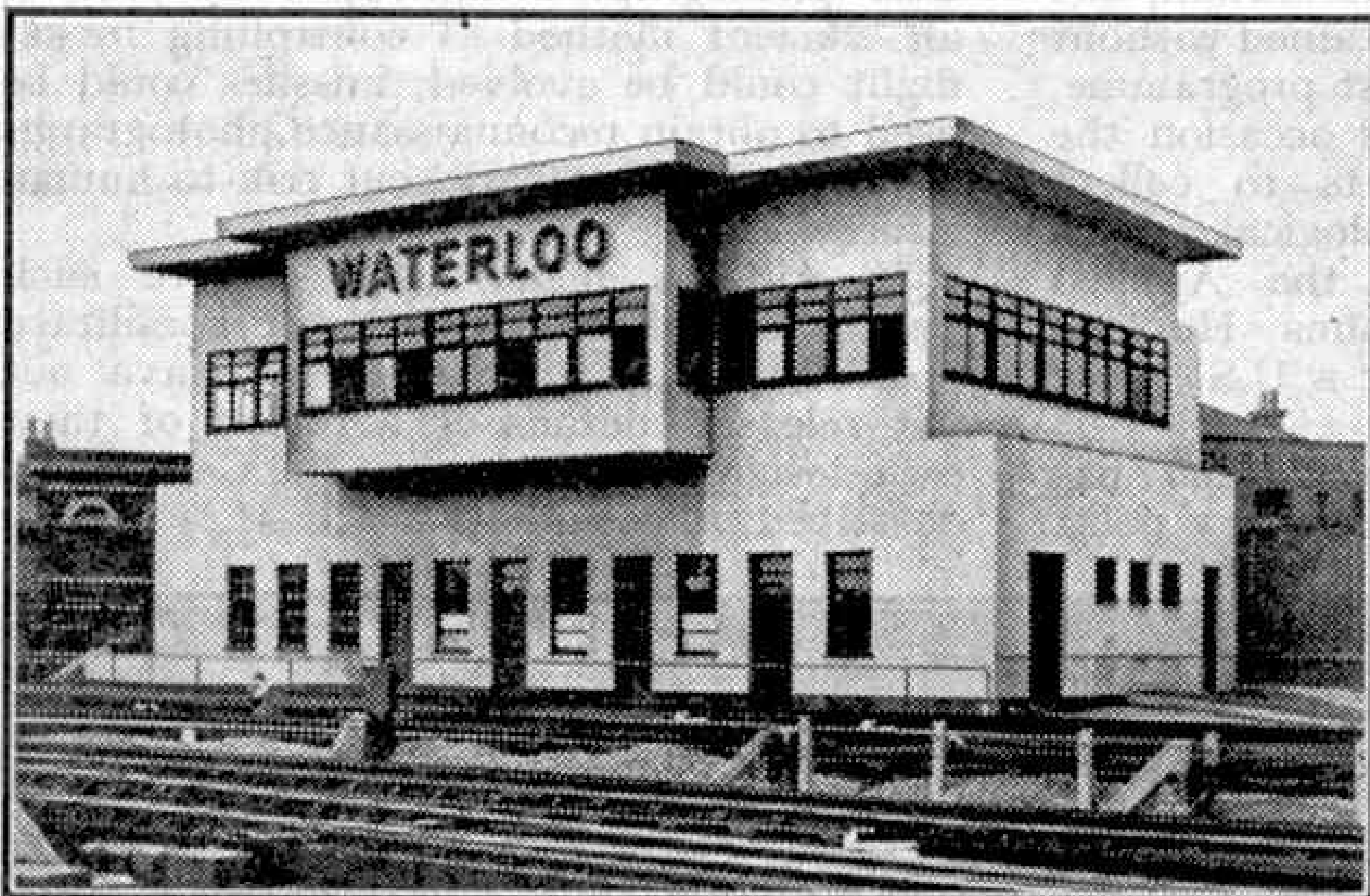
A little while ago, through the courtesy of British Railways, Southern Region, I was privileged to visit the all-electric signal cabin controlling train movements in and out of the 21 platforms at Waterloo. This has been a familiar landmark to Southern railfarers since 1936, when it replaced six older boxes from Vauxhall to the terminus, including the famous Waterloo "A" Box that straddled the track beyond the platform ends.

The concentration of control thus obtained came with the introduction of

the once imposing array of semaphore signals. They stood thickly on the platform ends and some were mounted high on a gantry astride the tracks right by "A" Box itself; but to-day they have all gone. As a result the station approach at the outer end has a remarkably free and "open" appearance. The colour-light signals, being lower than the former semaphores, are relatively unobtrusive, but they are perfectly competent.

Unlike the traditional signal cabin with its wooden stairway outside, Waterloo

Box is entered on the ground floor, and the stairway leading up to the operating floor is inside. So you approach the scene of activities much as you gain the landing at home, and arrive on the upper floor in the far corner shown in the interior view on the next page. Your first impression is that although there are three men working the Box, with two booking boys and a supervising Inspector, there is practically no noise. Train describers and telephones buzz but there is none of the familiar clatter as when levers are pulled



The all-electric signal box at Waterloo, Southern Region. This and the upper illustration on page 69 are reproduced from British Railways Official Photographs.

colour-light signalling between Hampton Court Junction and Waterloo and it formed part of the general scheme for improving the terminal rail approaches. This scheme included layout alterations, involving a concrete fly-over viaduct as far out as Wimbledon to avoid confusion between different streams of traffic. This development may be considered as the most recent step in the reorganization and reconstruction of the station, which passed through so many different stages at different times.

At one time, as the Editor remarked recently, Waterloo was something of a joke; to-day with its 200,000 passengers and nearly 1,200 trains in the course of 24 hours, it is a complex but highly competent component of the Southern transport machine. If the old "A" box and its satellites have gone, so also has

off or put back to normal in a mechanically-worked box, and there is no heaving or straining for the signalmen. And everywhere is neat, clean and orderly.

Points as well as signals are electrically controlled, requiring 136 points machines housed in neat cast-iron cases alongside the switch rails. A 130-volt battery in the basement of the Box provides the power, so that points can be moved even if a mishap should cut off the normal signalling supply.

There are levers to pull, of course, but they are quite small ones, and they can be worked with the finger and thumb of one hand. But they cannot be worked at all unless conflicting levers are in the correct position; and the signals will not then change from the "danger" aspect unless the track is clear and points are correctly set for any given movement.



An interior view showing two of the all-electric lever frames. Note the illuminated diagrams on which train movements are automatically indicated.

This is because the whole area controlled by the Box is divided up into 153 track-circuited sections and electric locking ensures that conflicting or incorrect signals cannot be given. I know; I was allowed to try it, when under the Inspector's expert guidance, I set the road for an incoming electric train, an operation requiring four or five lever movements in order, and I assured myself that until this sequence had been completed it was impossible to admit the train.

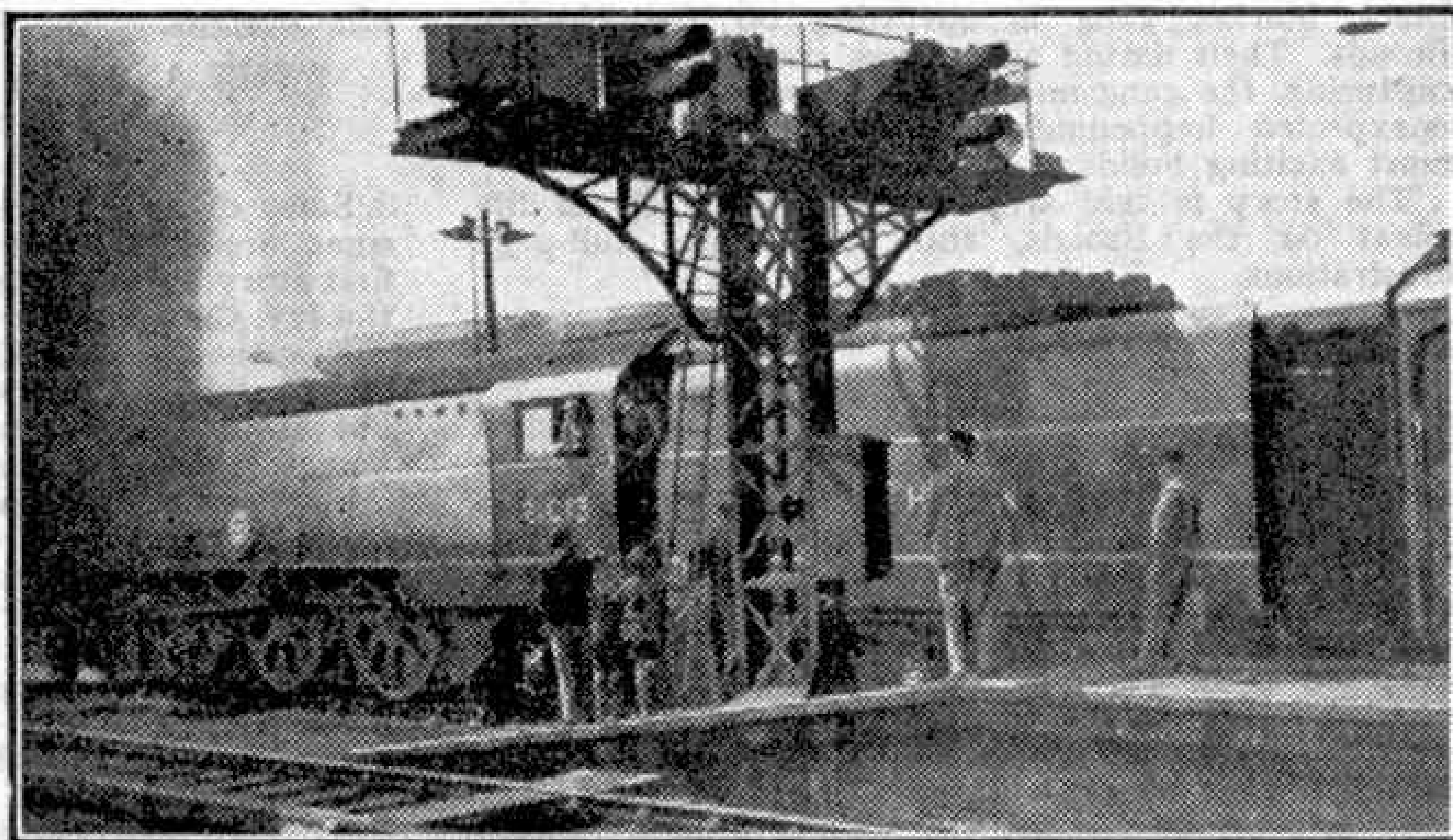
There are 81 controlled signals and route indications, 20 automatic signals and 65 shunt signals in the Waterloo installation. For the number of levers in use—309 replacing the 499 in the six boxes previously controlling the area—Waterloo Box is remarkably compact. Yet it houses three lever frames, one long one running along the back wall and a shorter one across each end. Although I call them lever "frames," they are not like the ordinary mechanical frames with which most readers will be familiar. Actually each frame somewhat resembles a long desk or cabinet with the dwarf levers projecting upward in front of a back panel in which each individual signal aspect is repeated, as well as the positions, normal or reverse, of

all points. By each lever are marked the numbers of the other levers that must be moved in sequence in order to release it.

Each of the end lever frames has its illuminated control panel, and owing to the length of the long frame two are provided above this. These panels display a diagram of the tracks controlled from the box; these approach Waterloo from what is known as "*Loco. Junction*" (Nine Elms) through Vauxhall and

so to Waterloo itself where eight roads fan out to serve the 21 platforms. A series of lights on each panel connect with the track circuits to show whether a section is occupied or not. Thus the progress of a train through the sections can be traced by the indicator lights along its track on the panel, each winking in turn as the train proceeds. In addition to this notable aid to efficient working there are 16 train describers. These record and can store messages offering trains or engines from the next box down the line.

An interesting detail that appealed to me was the series of indicator lights, one to each platform on the control panel, that lit up intermittently during my stay. These lights are operated by the Platform Foreman, and form a message from him to the (Continued on page 84)



A typical platform-end study at Waterloo. The engine is No. 21C13 "*Blue Funnel*," ready to leave with the "*Bournemouth Belle*." Photograph by F. G. Reynolds.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.

"TRAINS ANNUAL 1949"

Edited by CECIL J. ALLEN, M.Inst.T., A.I. Loco.E.
(Ian Allan Ltd. 7/6)

"Trains Annual 1949" presents a pleasing and well-illustrated variety of articles on railway subjects. In it the Editor, Cecil J. Allen, who needs no introduction to our readers, writes admirably about the first year of nationalized British Railways, describes the world's biggest railway bridges and tells us something about the remarkable streamlined trains that are such a feature of current American railroad practice.

An impressive team of writers contributes the remainder of the contents of the book. Among them are David L. Smith, well known for his intimate acquaintance with the former G.S.W.R., with his lively "Tales of the South West," and R. E. Charlewood, an authority on train services for many years, who traces the development of "The Flying Scotsman" from its earliest days.

Railway working in the Ruhr, the mysteries of slip-coaches, once so popular, footplate experiences in France, signalling developments, electric locomotives, multi-cylinder steam locomotive practice and an American troop train journey are among other fascinating topics dealt with. We end with the little-known Cromford and High Peak Line, with its fearsome gradients, which is described at first hand—of course with excellent photographs—by H. C. Casserley.

The illustrations include a special survey in pictures of British locomotives in 1948 and of the exchange trials carried out during the year. Many of the subjects are striking, and all are well reproduced on art paper.

In its attractive coloured jacket the Annual will be welcomed, particularly by junior railway enthusiasts. Copies cost 7/6 from leading booksellers and Ian Allan agents, or 8/- post free direct from the publishers at 33, Knollys Road, Streatham, London S.W.16.

"HOLIDAY RIVER"

By GLADYS MITCHELL (Evans. 6/-)

Pam, Gillian and Hilary on holiday in their motor-cruiser "Buccaneer," and David and Roger in the yacht "Saucy Sandboy," become suspicious that a Black Market gang is operating on the Norfolk Broads. Their daring adventures trailing, and finally capturing, the gang make thrilling reading, and these unexpected happenings give the five friends the most exciting holiday of their lives.

The story is told with interesting details of life afloat on the Broads, and has several full-page illustrations.

"THE L.M.R. LOCOMOTIVE REFERENCE BOOK"

By R. P. SYKES. 3/- post free

This book, now in its third edition, is published by Christian and Sykes on behalf of the British Locomotive Society. It gives the British Railways numbers, and names where carried, of all London Midland locomotives, including ex-L.M.S. engines of Scottish Region. The lists are in numerical order, class by class, and the depot to which each engine is attached is noted. Space is provided alongside the number columns for shed changes, livery and lettering details and other special notes. London Midland Motive Power depots and works also are listed.

As in previous editions, the book is of handy pocket size with a cover sufficiently stout to withstand wear and tear. Copies are obtainable from Mr. R. P. Sykes, 42, Coombe Road, Handsworth, Birmingham 20.

"A.B.C. OF AIRPORTS AND AIRLINERS"

By O. G. THETFORD
(Ian Allan Ltd. 3/6 net)

Aircraft enthusiasts living near airports, or able to visit them to watch the arrival and departure of air liners of various nationalities from the public enclosure, will find this handbook of great value. It contains detailed lists of the aircraft fleets of British and foreign air transport companies, giving in each case the registration letters and names of the machines. There is also an alphabetical guide to air liner registration, while the airlines operating services to and from the British Isles are named.

Scale plans of the principal airports in the British Isles, with timetables of the services using them and details of the types of machines employed, also are included, and in the case of London and Prestwick airports the service details are grouped according to the day of the week, thus enabling the reader to see at a glance what airline arrivals and departures he can witness there on any particular day. Finally there are scale three-view silhouettes and specification details of the types of air liners in regular service, with a brief historical note on each type.

Nearly 60 excellent half-tone illustrations of some of the aircraft listed in the text add greatly to the interest of the book, and indicate the wide range of types of commercial transports in service to-day.

Copies of this book are obtainable from booksellers and most hobby shops, or direct from the publishers, Ian Allan Ltd., Mail Order Department, 33, Knollys Road, London S.W.16, price 3/9 including postage.

"A MISCELLANY OF BRITISH FLAGS"

By CAPT. G. G. THORNE, R.D., R.N.R.
(Brown, Son & Ferguson. 2/6 net)

Flags are of perennial interest to all boys, and especially to those who live by the sea, where flags take on an added meaning. Capt. Thorne has condensed into small space a surprising amount of information on British flags, telling us of their origin and going on to speak of their uses. Every page has its own special interest, and there is ample evidence of the author's familiarity with his subject and of his practical experience of flags and their uses.

There are two coloured plates, showing the development of the Union Flag and of the red, white and blue ensigns.

"THE ANIMALS OF BUTTERMILK HALL"

By KATE FLOYD MORTON
(Harrap. 5/- net)

Some of Kate Floyd Morton's animals are wild and some are tame, but from the mother bird of her first story to the little creatures of the world beneath the ivy, that provide the last, they are full of interest. The author lives in Derbyshire, where her family are known to have settled since Tudor times, and she has studied sympathetically the animals about her home, penetrating into their very minds.

Readers will learn to understand these animals from the author's stories of them. They will meet a stoat and a lame rook, a bob-tailed fox and a blue sheep dog rescued from a cruel owner, a pet lamb and a London pony that found a home at Buttermilk Hall; and they will revel also in the stories of such pests as a king rat and the mice that live in the thick walls of the old Hall. When they have read these tales they will be equally delighted with the discussion on the minds and senses of animals and birds with which the book is brought to an end.

Fine drawings by Mary Shillabeer add to the fascination of the book.

Photography

Table-Top Scenes

TABLE-TOP photography consists of arranging miniature models on a table or baseboard in such a way that they represent a scene, and photographing the assembly at close range to obtain the illusion of a full-size scene. It is an ideal pastime for winter evenings. Most of the simple materials required are ready to hand in the home, and only a little skill and ingenuity are needed to build up very realistic and charming scenes.

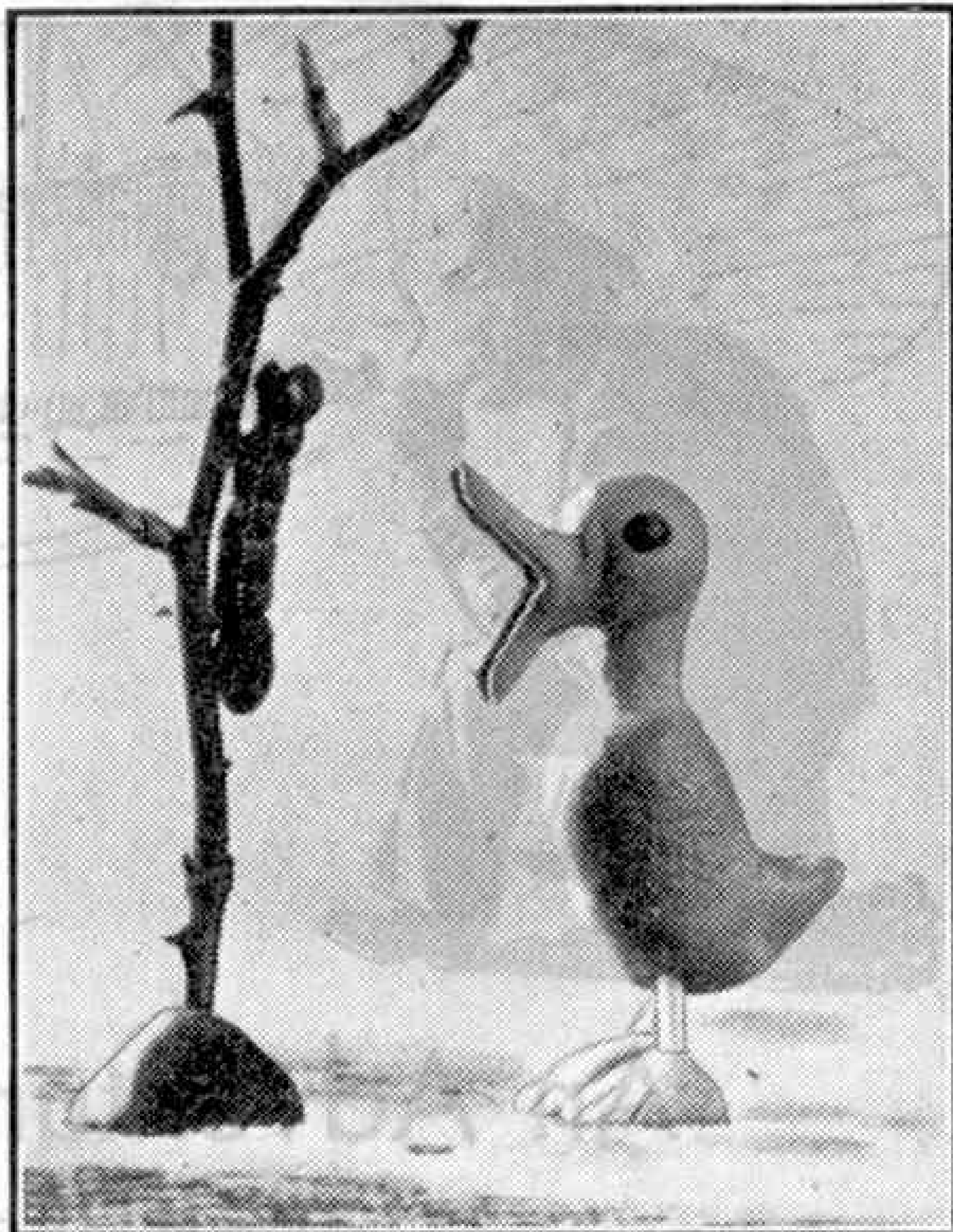


"A New Tale of Old Japan." This fine table-top photograph is by A. G. Dell, London S.E.27.

A small table can be used as the stage, but a baseboard about 18 in. by 12 in. is better. You may prefer to design your own scenery, but if not you can manage quite well by cutting out a suitable scene from some illustrated paper and pasting it on to a sheet of cardboard. Even a background consisting of a plain grey or buff card, in front of which the various items can be grouped to form a scene, is very effective.

Meccano Dinky Toys motor vehicles are ideal for table-top photography, and small dolls, tiny ornaments or die-cast figures are excellent for "peopling" the scene. Small pieces of rock and stone can be used to represent crags and boulders, sawdust dyed green does for short grass and sand for paths, and twigs cut from bushes in the garden make excellent trees. Cotton wool does well for snow, and a coating of salt can transform any scene into a realistic miniature picture of winter. These are just a few ideas; others quite as simple will occur to you. It is almost as much fun experimenting to obtain the desired effect as it is taking and developing the photograph of the scene.

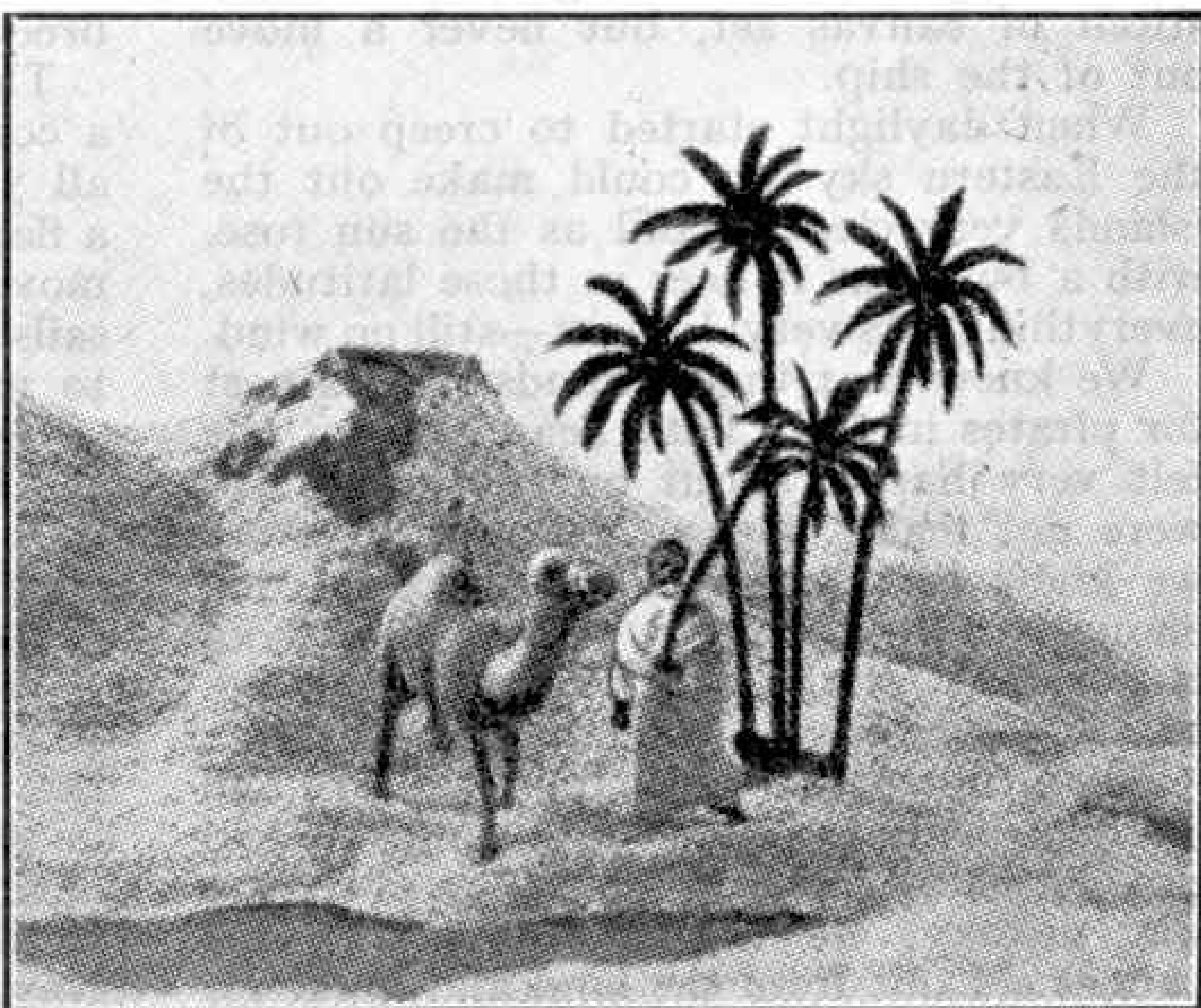
The camera must be used close to the subject, and sharp focussing is very important. A camera fitted with a focussing screen is the most suitable type for this work, but a box-form or other non-focussing camera can be used with good result if a portrait attachment is fitted to the ordinary



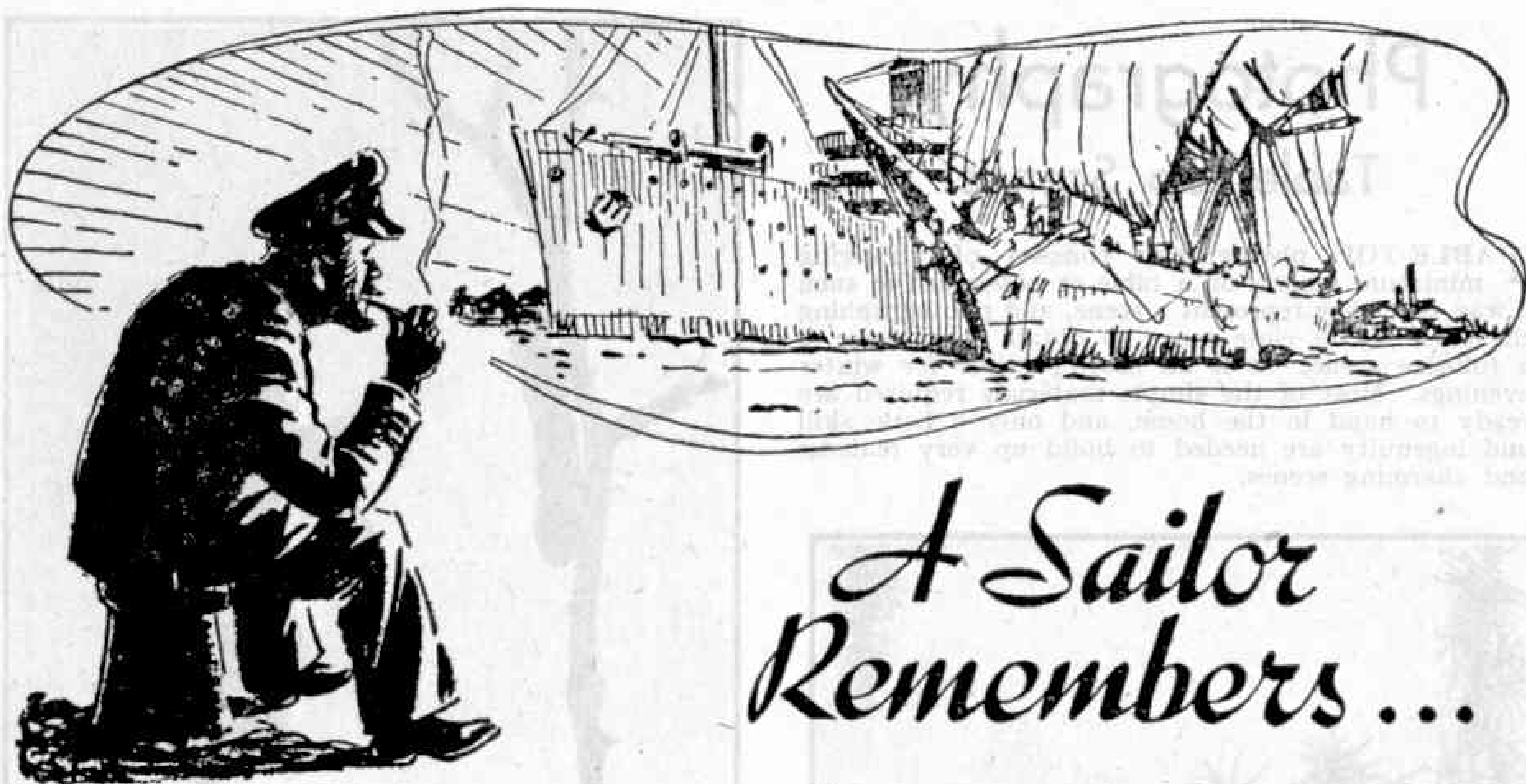
"The Early Bird." A humorous table-top subject by A. W. Bull, Beeston.

lens. This will allow the camera to be placed at a distance of 3 ft. from the picture. This distance should be measured accurately from the camera lens to the main feature of the picture.

Good lighting also is most important. Table-top subjects to be photographed in daylight should be placed close to a window in such a position that the light comes from the side and slightly in front. For table-top photography by artificial light it is best to place the scene almost directly under a top light of, say, 60 watts, and have a second and less strong light to one side and slightly in front to avoid flat lighting.



"A Desert Oasis." Sawdust, pieces of rock and toy figures are used in this interesting table-top scene.



A Sailor Remembers ...

An Adventure with Pirates

By Capt. H. H. Neligan

ONCE upon a time, in the long ago, I was in one of those beautiful clipper ships bound to China. We were well on our way, and in the North Pacific Ocean, being helped on our journey by the fresh North East trade winds, and steering West for the port of Hong Kong.

One evening we sighted some islands away on our port side, so far off that we could only just make out the land. As the sun went down, so did the wind, and we lay in a dead calm all night, with every stitch of canvas set, but never a move out of the ship.

When daylight started to creep out of the Eastern sky we could make out the islands very clearly, and as the sun rose, with a burst, as it does in those latitudes, everything was very distinct—still no wind.

We knew that those islands were a nest for pirates in the China Seas, and no one felt very happy about our position. We were not really uneasy, however, because we knew that any wind that was strong enough to bring out a pirate junk from the islands would also be strong enough to take us away.

Then the unexpected happened. We had all been thinking of a junk, and we had not bargained for canoes. Presently, to our dismay, we saw about twenty big canoes set out from the land and make for the ship.

As we were still becalmed, all we could

do was to prepare to defend ourselves by every possible means, for we knew what would happen to us if the natives succeeded in getting on board. Every gun and every weapon of any kind was got ready. As a final precaution every pot and pan that could be placed on the galley stove was filled with water and set on the range to boil, for even a savage cannot argue with scalding water. All this time the canoes were coming along at their utmost speed.

How we whistled and waited for a breeze!

The foremost of the canoes were only a couple of ship's lengths off, the savages all yelling and shouting, when there was a flap of our light sails. There was a faint move in the air at last! Then the heavier sails caught the wind, and the ship started to move.

In the space of a few minutes we had the brave Trade Winds back again, and were bowling along in good style, leaving all that crowd of natives yelling with rage on being deprived of their prey.

We sailed on and arrived safely in Hong Kong, where the incident was reported to the Admiralty there. They sent a gun boat out, and before we left Hong Kong again I had the satisfaction of seeing one of the head pirates brought on shore under Naval Escort, taken up the Hill outside the town, and shot.

So ends an adventure with pirates.

Among the Model-Builders

By "Spanner"

A Novel Rack and Pinion Drive

Machine tools make excellent subjects for Meccano models, but it is sometimes difficult to decide a suitable means of arranging the feed mechanism that forms a feature of many such machines. The most satisfactory method of constructing this is to use a Pinion meshed with a Rack Strip, but J. T. Morton, Ashby-de-la-Zouch, has devised a novel substitute making use of Sprocket Chain and Wheels.

The device is illustrated in Fig. 1, and consists of a length of Sprocket Chain fixed to a suitable bed. One end of the Chain is attached by opening out the end link and passing its lugs through a hole in the bed. The other end of the Chain is firmly tied by a short length of Cord or wire, but it is important to make sure that the Chain is tightly stretched and that side-play is reduced to a minimum. A Sprocket Wheel is then arranged so that its teeth engage the Chain, giving the same effect as the more usual Rack and Pinion.

In the illustration the Sprocket Wheel is mounted on a short Rod held in Slide Pieces that are free to slide on $5\frac{1}{2}$ " Strips. In practice, however, the Wheel is mounted underneath the tool rest of the machine, so that by turning the Wheel the tool rest is carried along its bed.

An Interesting Model from Sweden

I received from J. M. Schenström, Surahammas, a Swedish engineer, who is also an old Meccano model-

builder, photographs of a fine model steel furnace charger that he built recently. One of the photographs is reproduced on this page, and I think that model-builders

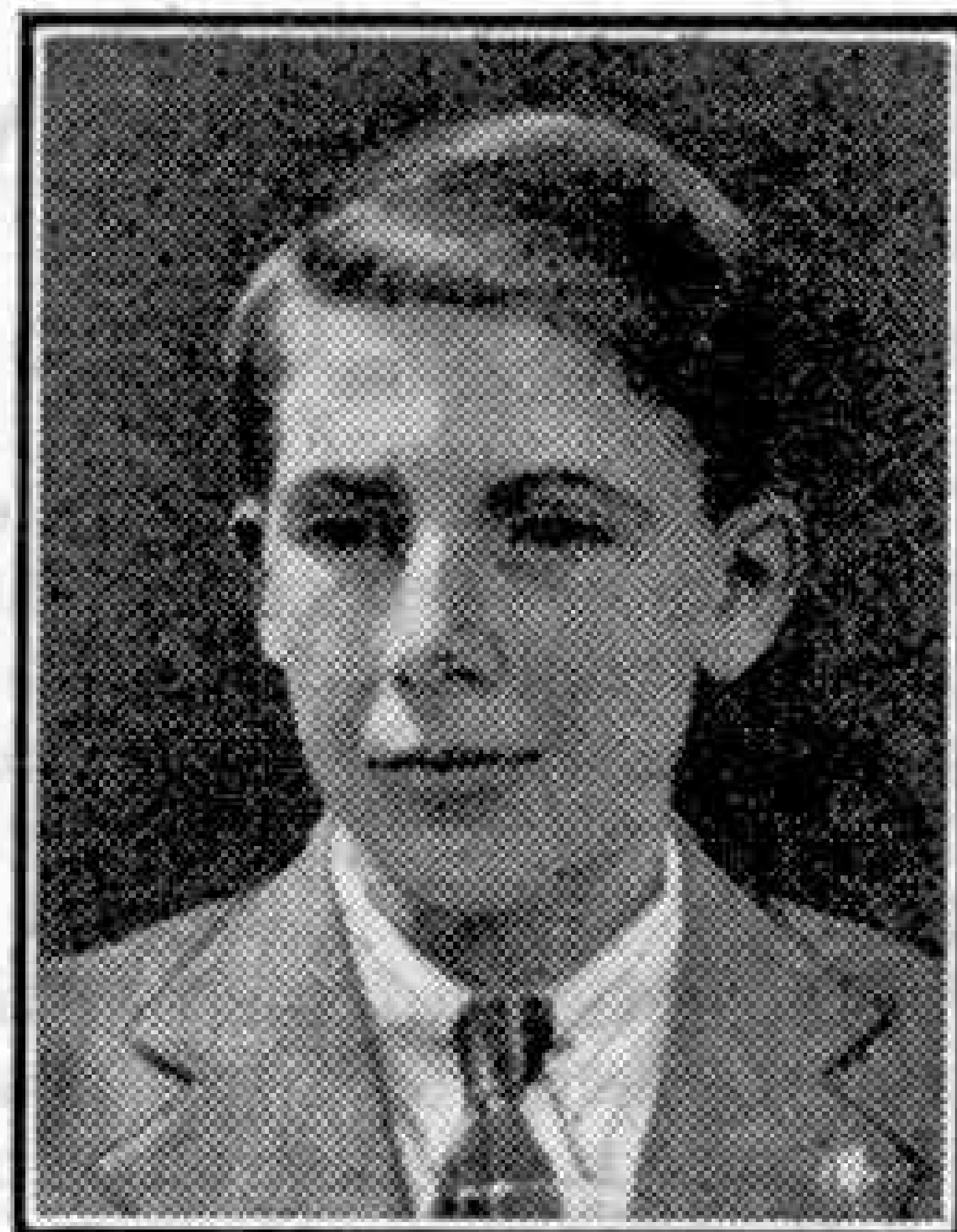
on the look-out for

unusual subjects will find it of interest. The charger is based on an actual plant manufactured by Wellman-Smith Owen Engineering Corporation Ltd., and is built to a scale of approximately 1:10. Mr. Schenström is the manager of the forging shop at a steelworks in Sweden, and he built his model for experimental purposes at the works. As a result of these experiments an order for an actual machine was eventually placed.

The model can make all the movements of an actual charger, and is very neatly constructed.

Models of this kind make a welcome change from the more usual subjects such as vehicles, locomotives and cranes, and they

provide plenty of scope for ingenuity in reproducing complicated mechanisms and drives.



P. R. Brown, Oldbury, nr. Birmingham, who won a Third Prize in a Meccano Model-Building Competition.

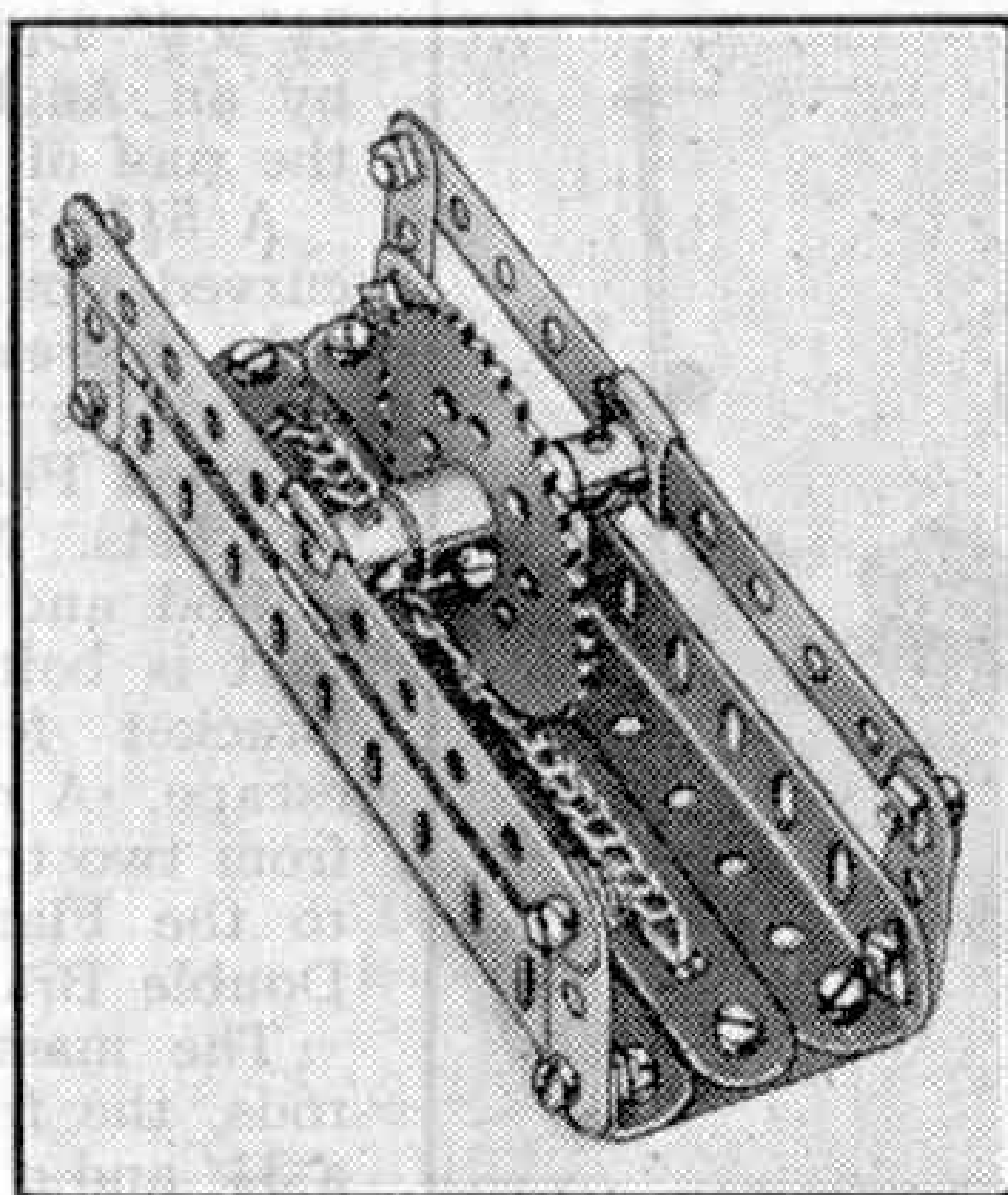
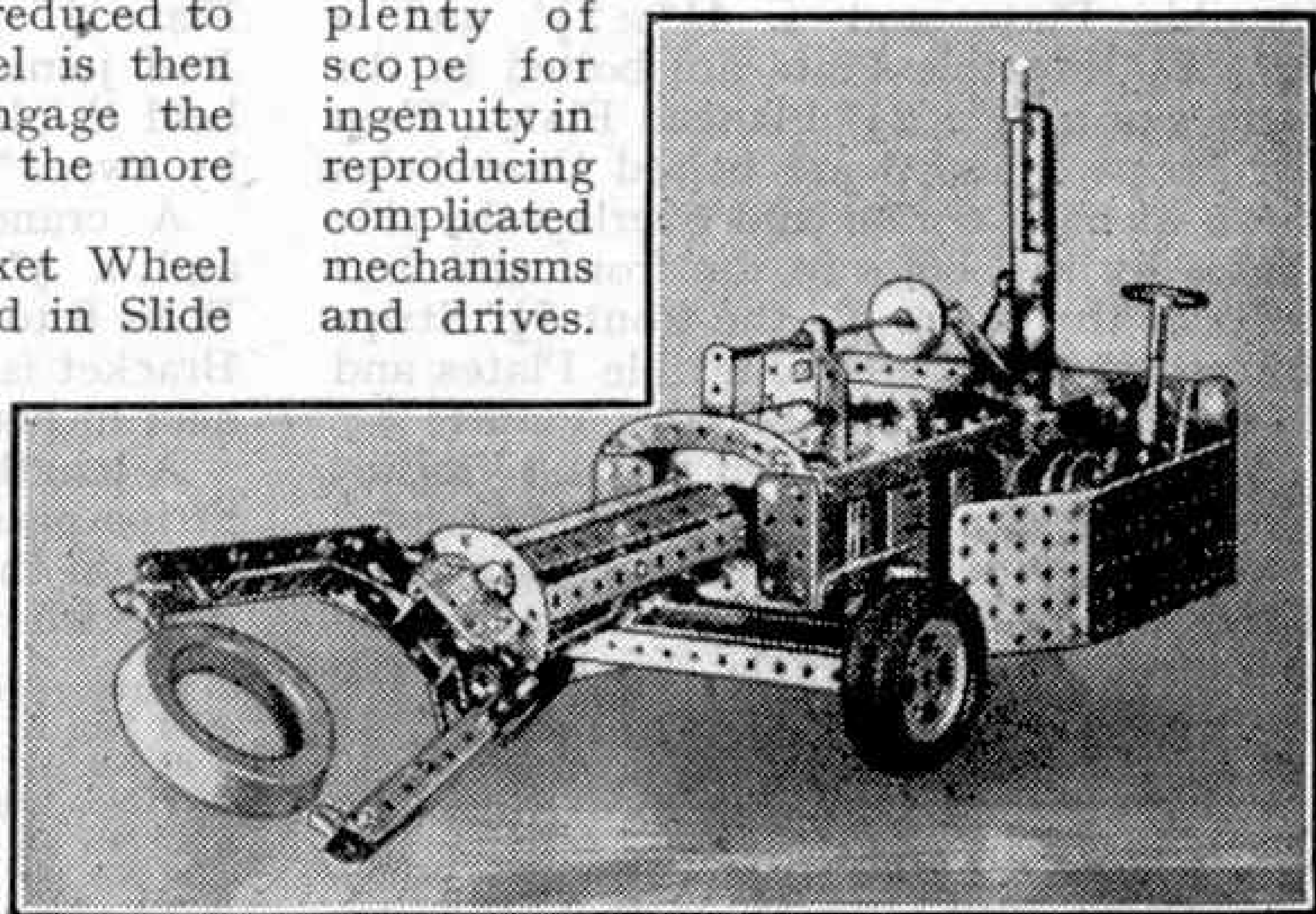


Fig. 1. A novel rack and pinion device using a Sprocket and Chain.



A model of a furnace charging machine used in iron and steel making. It was built by Johan M. Schenström, Surahammas, Sweden.

New Meccano Models

Cargo Boat—Galleon-type Sailing Ship

THIS month we give details of two new models specially designed for the many model-builders who like constructing ships. One of these is a fine cargo boat built from Outfit No. 3, which is illustrated in Figs. 1 and 2, and the other is a reproduction of an old-time galleon type vessel, seen in Fig. 3, which is designed for construction from the parts in Outfit No. 1.

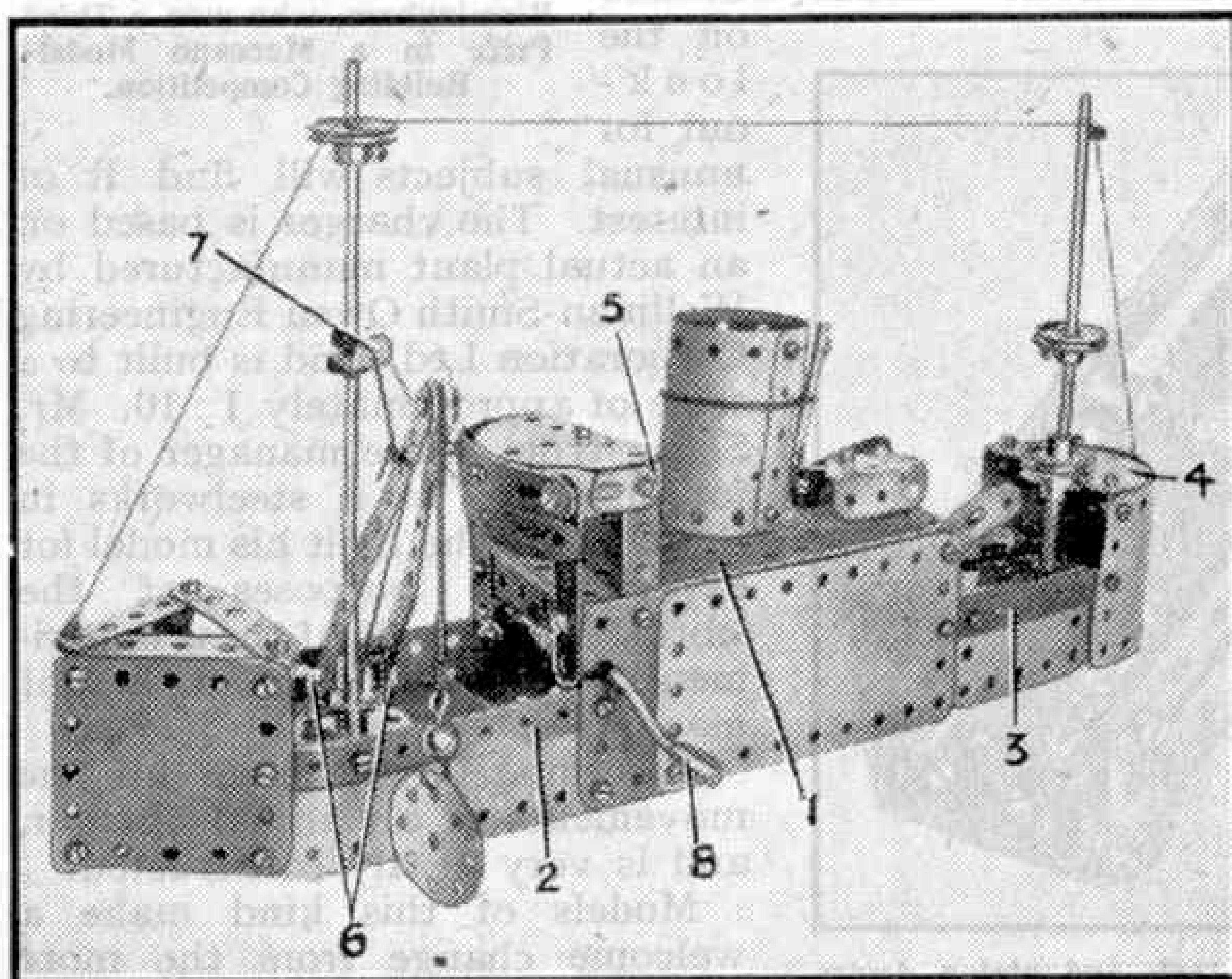


Fig. 1. A simple model cargo vessel, built from Outfit No. 3.

In building the cargo ship a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate are bolted to the flanges of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. Then $5\frac{1}{2}''$ Strips 2 and 3 are bolted three holes down at each corner and overlap the side Plates by two holes in the front and four holes at the back. To the front $5\frac{1}{2}''$ Strips are attached $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates and to the back $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates.

The fo'castle consists of two $1\frac{1}{8}''$ radius Curved Plates overlapping the $5\frac{1}{2}''$ Strips 2 two holes and bolted together as shown. Three $2\frac{1}{2}''$ Strips are attached to the top of the fo'castle by Angle Brackets in the form of a triangle.

The stern superstructure is represented by a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate curved and overlapping the $5\frac{1}{2}''$ Strips 3 by two holes. The top is filled in by a Semi-Circular Plate 4 attached to the $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Plate by two Angle Brackets.

A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 9 supported by a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip covers the fore deck, while two U-Section Curved Plates and a $2\frac{1}{2}''$ Strip 10 cover the aft deck.

The bridge is made by bolting four $2\frac{1}{2}''$ Strips to the Flanged Plate and attaching to them a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 5 and a Formed Slotted Strip. A second Formed Slotted Strip is attached to the first by a Fishplate. A Semi-Circular Plate bolted to the $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip by an Angle Bracket forms the roof of the Bridge.

A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate curved and overlapped one hole represents the funnel and it is attached to the Flanged Plate by two Angle Brackets. A 2" Rod fixed in a Rod and Strip Connector that is bolted to the Angle Bracket forms the steam escape. A cabin constructed from two trunnions is bolted to the Flanged Plate by a Double Bracket.

The masts are compound rods, the front consisting of a $3\frac{1}{2}''$ and a 4" Rod joined by a Rod Connector. It is mounted in a Bush Wheel that is bolted to the $2\frac{1}{2}'' \times \frac{1}{2}''$

Double Angle Strip supporting the Flexible Plate 9. The aft mast is a $3\frac{1}{2}''$ and 4" Rod joined together by a 1" Pulley and held in place in the Semi-Circular Plate 4 by two 1" Pulleys.

A crane consisting of two $5\frac{1}{2}''$ Strips and a $\frac{1}{2}''$ Pulley is lock-nutted by the Bolts 6 to a Double Bracket. The Double Bracket is pivoted on the foremast and is held in place by a Cord Anchoring Spring.

A length of Cord tied to one of the $5\frac{1}{2}''$ Strips passes through an Angle Bracket 7 held on the mast by two Spring Clips and it is tied to the Crank Handle 8.

Parts required to build the model Cargo Ship:
6 of No. 2; 8 of No. 5; 3 of No. 10; 2 of No. 11;
8 of No. 12; 1 of No. 15b; 3 of No. 16; 1 of No. 17;
1 of No. 19g; 4 of No. 22; 1 of No. 23; 1 of No. 24;
5 of No. 35; 50 of No. 37; 6 of No. 37a; 4 of No. 38;
1 of No. 40; 2 of No. 48a; 1 of No. 52; 1 of No. 57c;
2 of No. 90a; 5 of No. 111c; 2 of No. 126; 1 of No. 176;
1 of No. 186; 2 of No. 188; 2 of No. 189; 2 of No. 190;
2 of No. 191; 2 of No. 192; 2 of No. 199; 2 of No. 200;
1 of No. 212; 1 of No. 213; 2 of No. 214; 2 of No. 215.

Galleon-type Sailing Ship

Owners of Outfit No. 1 will have all the parts required to build the interesting little galleon-type sailing ship shown in Fig. 3. The main part of the structure of this is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 1 fixed flanges upward. This forms the main deck, and to its sides are bolted two $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates 2 to form the sides of the hull. At the bows two $2\frac{1}{2}"$ small radius Curved Strips are fixed as shown, and bolted to the forward end of the Flanged Plate 1 is a Trunnion 3 and a $5\frac{1}{2}"$ Strip 4 that represents a mast. The other mast is also a $5\frac{1}{2}"$ Strip, and it is bolted to a Trunnion 5 fixed to the Flanged Plate in the position indicated. The forward and the rear mast each carry two Fishplates 6 representing cross spars and the rear mast carries in addition a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 7.

A $2\frac{1}{2}"$ Strip 8 is bolted to the Flanged Plate at each side, and to each of these a $5\frac{1}{2}"$ Strip 9 and a $2\frac{1}{2}"$ Strip 10 is fixed. The bolts that hold the $2\frac{1}{2}"$ Strip serve to hold also a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 11. The stern end of the ship is formed by two Flat Trunnions. Through these passes a $3\frac{1}{2}"$ Rod 12, which is held by Spring Clips pressed against the Flat Trunnions.

Parts required to build the Sailing Ship: 4 of No. 2; 4 of No. 5; 4 of No. 10; 1 of No. 16; 3 of No. 35; 22 of No. 37; 2 of No. 37a; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 2 of No. 126; 2 of No. 126a; 2 of No. 189.

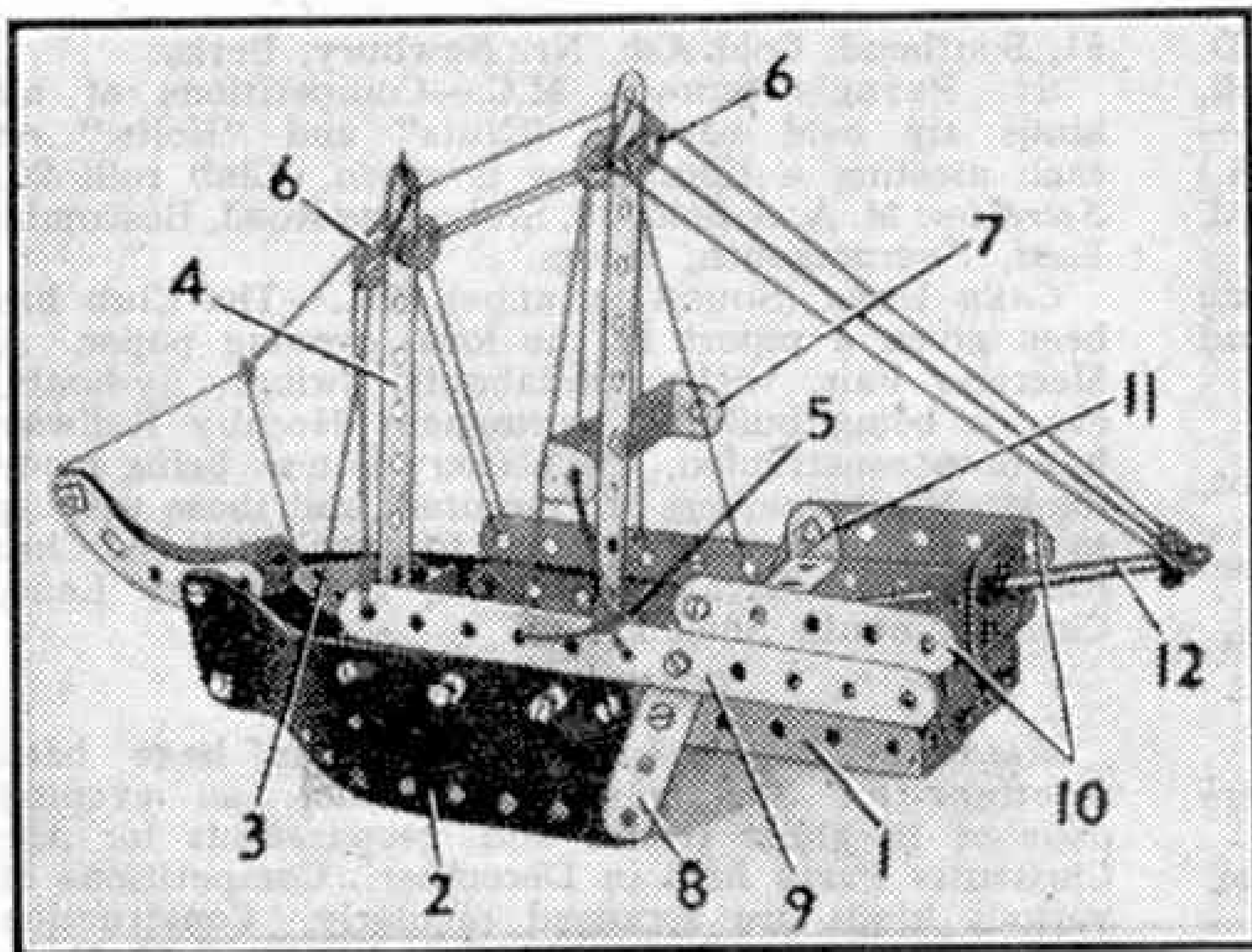


Fig. 3. A realistic galleon-type sailing ship. It can be built from parts in Outfit No. 1.

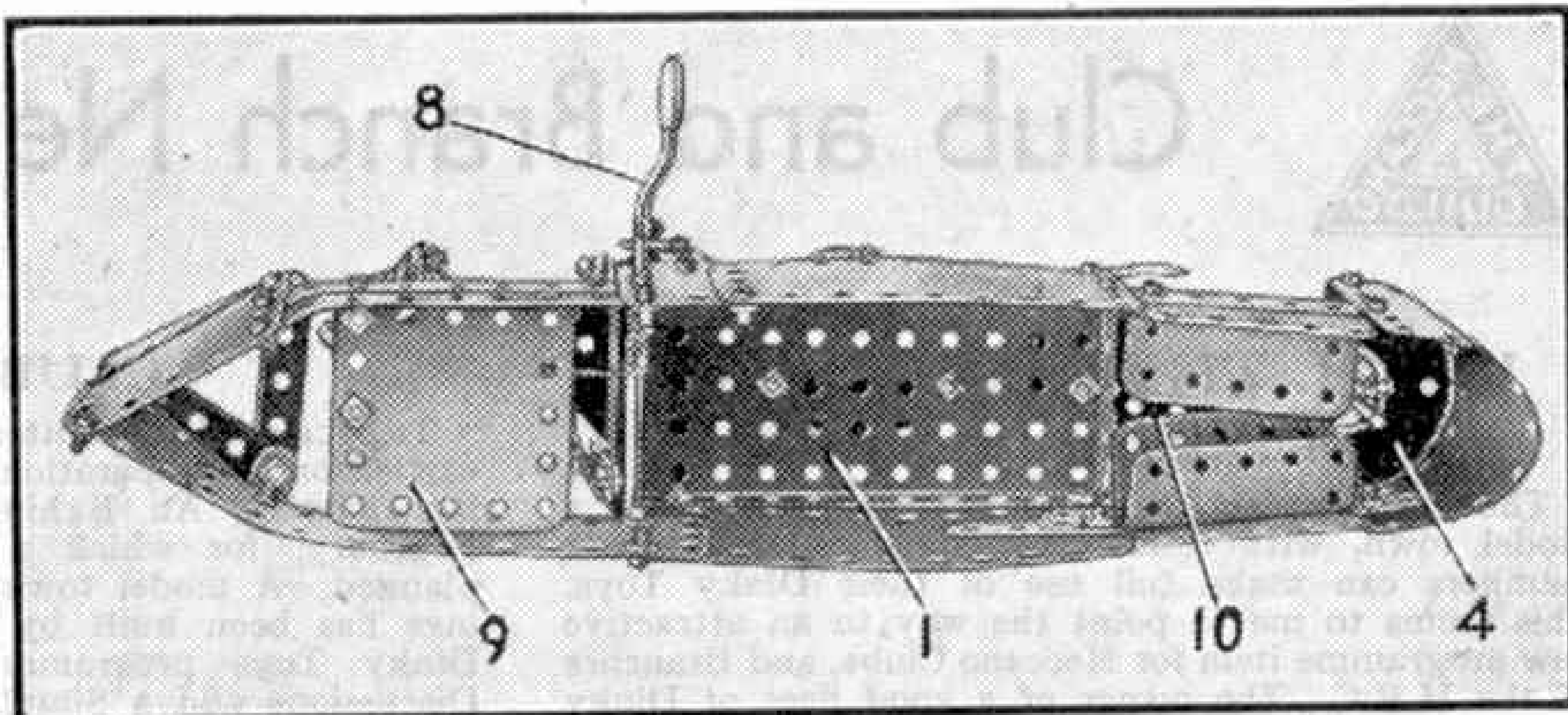


Fig. 2. An underneath view of the hull of the cargo ship shown in Fig. 1.

Fine Cash Prizes for Meccano Models

Fine cash prizes for models of any kind built by readers of the "M.M." are offered in the grand "New Year" Model-Building Competition, details of which are given here. There are no age limits and the only conditions are that models must be built from Meccano Parts and must be the unaided work of competitors themselves. There are no restrictions whatever on the kind or size of models that may be submitted.

The competition is divided into two Sections: A, for competitors of all ages living in the British Isles; B, for competitors of all ages living Overseas. The prizes to be awarded in each Section are as follows: First, Cheque for £3/3/-. Second, Cheque for £2/2/-. Third, Cheque for £1/1/-. There will be also five prizes each consisting of a P.O. for 10/6, and five prizes each of 5/-. Certificates of Merit will be awarded to competitors whose models in the opinion of the judges just fail to reach prize-winning standard.

Section A will remain open for entries until 28th February, but Overseas readers entering for Section B can send in their entries up to 31st May next.

Competitors should note that actual models must not be sent. A photograph or a neat sketch of the model, together with a few details of its chief features, are all that is required. Entries should be addressed "New Year Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."

Illustrations of prize-winning models become the property of Meccano Ltd., and will not be returned. Prizewinners will be notified by letter.



Club and Branch News



WITH THE SECRETARY

DINKY TOYS LAYOUTS

The Secretary of the Thatcham M.C. has built a model town, with countryside surrounding, so that members can make full use of their Dinky Toys. This seems to me to point the way to an attractive new programme item for Meccano Clubs, and Branches of the H.R.C. The owner of a good fleet of Dinky Toys thoroughly enjoys possessing it, but enthusiasts get most fun from this hobby by making use of their possessions. At first they may be content with makeshift arrangements on the table, in which imagination plays a great part, but soon they begin to mark out roads on boards of some kind, and follow this by constructing buildings if a town scene is required, or fields and hedges if a countryside scene is favoured. As the road system is extended, roundabouts, halts and other features are introduced, and the running of Dinky Toys motor cars, buses and other vehicles is made more and more attractive.

MERIT MEDALLIONS FOR 1949

I am sorry to find that Leaders of Meccano Clubs are not yet making full use of the Merit Medallion. Good work on behalf of his Club by any member should be recognized, whether it consists of bringing in new members, helping to organize proceedings, suggesting new schemes of interest, or faithfully carrying out the aims and objects of the Guild in some way over a long period, and the Merit Medallion has been introduced for this express purpose. The judge of the work for which it is awarded is the Leader, who is in regular contact with his members and can best decide the value of their Club work.

I have pleasure in congratulating the following Club members on earning this award, the highest open to Guild members, since my last list appeared. BOSTON M.C.—K. J. Cross, P. E. Luff, R. C. Sharp, M. T. Ward; HUNTINGDON M.C.—T. Abbot, P. Burton, J. Cowling, T. Edwards, D. Fuller, F. Hodge, G. Hunter, P. Marshall, R. Newell, F. Young; MALVERN (JOHANNESBURG, S.A.) M.C.—D. Stocker, T. Tregear; MAYLANDS (PERTH, W.A.) M.C.—V. Chester, D. Coultas, G. Friend, K. Leppard, W. Sansam, A. Youens.

I urge Leaders to keep this award in mind during 1949, which should be a year of real progress and expansion in the Club world.

BRANCHES RECENTLY INCORPORATED

- B.512—DIDCOT—R. Haskens, 20, South Road, Didcot, Berks.
 B.513—HIGH BLANTYRE—A. McLachlan, 15, School Lane, High Blantyre, Glasgow.
 B.514—MAGDALEN COLLEGE SCHOOL (OXFORD)—R. A. Bowen, 13, Richmond Road, Oxford.

PROPOSED CLUBS

- LONDON—P. Sonneborn, 78, The Ridgway, Golders Green, N.W.1.
 LONDON—M. Lustig, 33, Vincent Court, Bell Lane, Hendon, N.W.4.
 LONDON—M. Rose, 13, Cresswell Place, S.W.10.
 NOTTINGHAM—T. Thorburn, 12, Mabel Street, Meadows, Nottingham.

CLUB NOTES

THATCHAM M.C.—Intense model-building has been carried on in preparation for a Parents' Evening held last month. An Exhibition is to be held during February, for which a Hornby Layout has been planned. A model town with countryside surroundings has been built by the Secretary, and on this Dinky Toys programmes are carried out. Film Discussions and a Simplicity Model-building Contest in which the prize was a Dinky Toy also have been held. Club roll: 22. Secretary: B. M. J. Ambrose,



A few members of the Magdalen College School (Oxford) Branch, No. 514, with Mr. Northover, its first Chairman. The President is Mr. R. S. Stanier, the Chairman Mr. G. Howden, and the Secretary R. A. Bowen. This Branch was incorporated in December of last year. Its meetings are held weekly in the School Physics Laboratory, where there is ample room for an extensive layout giving good track operation.

51, Southend, Cold Ash, Nr. Newbury, Berks.

ST. PETER'S SCHOOL M.C.—Competitions of all kinds are held between "Nuts" and "Bolts." At each meeting a Film Show is given. Club roll: 26. Secretary: M. A. Arnold, 30, Seabourne Road, Boscombe East, Bournemouth, Hants.

CAER URFA (SOUTH SHIELDS) M.C.—The Club has been given a report in the local evening paper. A Meccano Fair, with roundabouts, swings, fly-boats, etc., is being built. A permanent Hornby Railway has been constructed, and scenery is now being made for it. More members are required, and those wishing to join should send a postcard to the Secretary. Club roll: 15. Secretary: G. Burrows, 113, Quarry Lane, Cleadon, South Shields.

SOUTH AFRICA

MALVERN M.C.—Interesting events have been meetings for Swimming and Games, an evening devoted to ghost stories and preparations for the Christmas Party held in December. Competitions of various kinds are arranged regularly. Construction Nights also have been enjoyed; in some of these members are arranged in teams. Secretary: K. E. Tanner, P.O. Box 8, Cleveland, Johannesburg.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE STORETON TRAMWAY

In 1837/8 a light railway was constructed from the Storeton quarries, in the Wirral Peninsula, through Bebington and what is now Port Sunlight to the Stone Quay at the mouth of the Bromborough Pool,



A length of rail, of the early fish-bellied form, of the old Storeton Tramway. Photograph by Cyril R. Rowson, Liverpool.

on the River Mersey. The most interesting feature of this old Storeton Tramway, as it was originally known, is the old-time rails. These were bought secondhand. It is thought they came from the Liverpool and Manchester Railway, the first really complete railway in the world, constructed by George Stephenson, and over them the "Rocket" may have run on its epoch-making journeys in the thirties of last century.

The accompanying photograph shows a length of the Storeton rails, no longer in use, and they certainly agree in dimensions and style with the original Stephenson track of the Liverpool and Manchester line. They were of the fish-bellied type, and were not fastened to wooden sleepers, but spiked down to square blocks of stone. Some of these blocks can be seen in a wall close to the Storeton quarries. Practically all the old rails have now disappeared, but fortunately a short stretch has been preserved, at the point where the track crossed the Spital Road, close to Lower Bebington Church.

Many of Liverpool's public buildings were constructed of the Keuper Sandstone brought down by the Storeton Tramway from the quarries, which date back to Roman times.

CYRIL R. ROWSON (Liverpool)

AUSTRALIAN PARKS NAMED AFTER FAMOUS AIRMEN

Two renowned Australian airmen, Sir Charles Kingsford Smith and Squadron Leader Bert Hinkler, are remembered at Katoomba, one of the Blue Mountain tourist resorts of New South Wales, Australia. The local Council have

fittingly named two of their pretty park reserves after them.

"Kingsford Smith Park" was originally known by the name of "Hudson's Gully," and the site was formerly a dump for waste material, covered with blackberry bushes. Now it has been transformed into a reserve of absorbing beauty. It covers three acres and is in the form of a huge amphitheatre, or "bowl," with sloping sides. Two artificial lakes fit into its layout, in addition to a children's playing area, and there is also a band rotunda. The park was opened in January 1940.

On the upper level, above the entrance gates, is a small-scale model of the world-famous monoplane "Southern Cross," in which "Smithy," as he was familiarly called, made his world-wide flights. The aircraft hovers over a globular map of Australia, symbolizing the airman's numerous Australian aerial ventures. He made the first crossing of the Pacific by air, and also made record flights between England and Australia. It is believed that he lost his life in the Bay of Bengal while attempting

another record flight.

The second reserve, named after Bert Hinkler, was dedicated on 27th November 1934. Flowers, shrubs and trees adorn the area, which includes also a children's playing ground. An artificial lake and attractive shelters are provided, and a commemorative plaque near one of the entrances records that the park was officially opened by Hinkler's mother. Hinkler achieved fame in 1928 by flying from England to Australia in a light aeroplane in 15½ days. He met his death in the Italian Alps during a further attempt on this record.

K. ALLEN (Oatley, N.S.W.)



A Kingsford Smith memorial at Katoomba, New South Wales. Photograph by K. Allen, Oatley, N.S.W.

To "Newcastle" by Hornby-Dublo

AS might be expected from its situation, the Hornby-Dublo layout of J. P. Heald, Newcastle-on-Tyne, represents part of the main line of the former L.N.E.R. The accompanying photograph shows "Grantham" station on this miniature East Coast Route. The layout, for the time being, is situated on the floor, but a scheme is afoot to provide a raised sub-structure or a suitable table when possible. The railway itself is simple and the equipment generally is not elaborate. Most of the buildings have been made at home and the general effect of the line is quite good, as the photograph shows.

"Grantham," "Darlington" and "Newcastle" are the chief traffic centres, the miniature "Darlington" being under construction at the time of writing. A typical express run involves the use of

evidence here and there on the layout and its equipment. A tunnel is situated between "Darlington" and "Newcastle" and near one end of it the general scene is improved by the use of suitably coloured fabric laid over various shapes to represent cuttings, banks and so on. In this setting a surfacemen's hut, a typical structure with brick chimney at one end, and some of the Hornby Trees available in pre-war days, look most real.

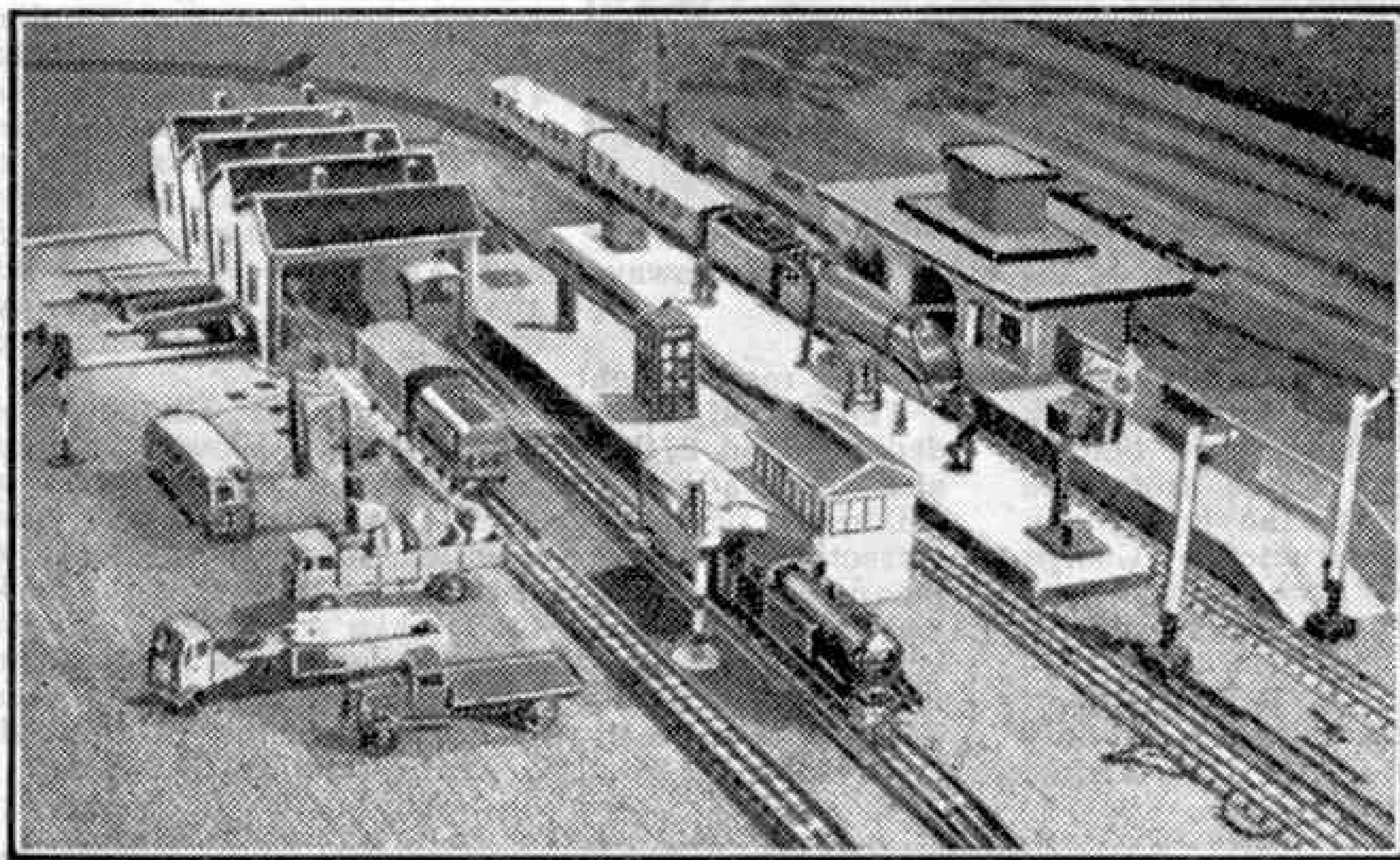
The imitation coal provided on the tender of the 4-6-2 has had a small quantity of real coal added on top of it, giving the well-heaped-up effect seen nowadays on actual tenders. Neat and realistic destination boards have been added to the coaches and they can just be distinguished under the edges of the coach roofs in the illustration.

Particularly good use is made of Dinky Toys, as has been suggested on many occasions in these pages. Various motor vehicles are used on and around the railway. Miniature crates and bales and such regular freight items as a load of timber appear on some of the motors shown in the "Grantham" goods yard.

An interesting adaptation of a road component to railway purposes is the use of a Robot Traffic Signal (Dinky Toys

No. 47y). This makes quite a good three-aspect colour light signal and is just about the right size for Hornby-Dublo railway purposes. Such signals do not "work" in the same sense as the standard semaphore type but they look particularly effective on a Dublo layout.

If the signals are to be used permanently for railway purposes alone, the orange beacon on top of the lamp case is easily removed. Similarly, the half-round hoods above the "lenses" on one side of the lamp case are not required if the signal is to be used for one-way traffic, as is usual in railway practice. The hoods not required can be filed off.



"Grantham" station on the Hornby-Dublo layout of J. P. Heald, Newcastle-on-Tyne. This railway follows former L.N.E.R. practice.

the familiar Hornby-Dublo L.N.E.R. corridor stock hauled by the popular streamlined 4-6-2 "Sir Nigel Gresley," a non-stop run being usually made between "Grantham" and "Newcastle." The completion of "Darlington" will provide an additional stopping place.

At the end of each journey the train engine invariably shunts its train. Although there is a Hornby-Dublo 0-6-2 Tank in service it is kept busy with local and goods traffic. This division of engine duties is simple and convenient and is frequently practised on Hornby-Dublo railways.

There are various realistic touches in

Two Readers' Hornby Railways

THE Hornby railways illustrated on this page provide some interesting comparisons. One shows an indoor system representative of so many Hornby layouts, that are put down for running and have to be taken up again afterwards.

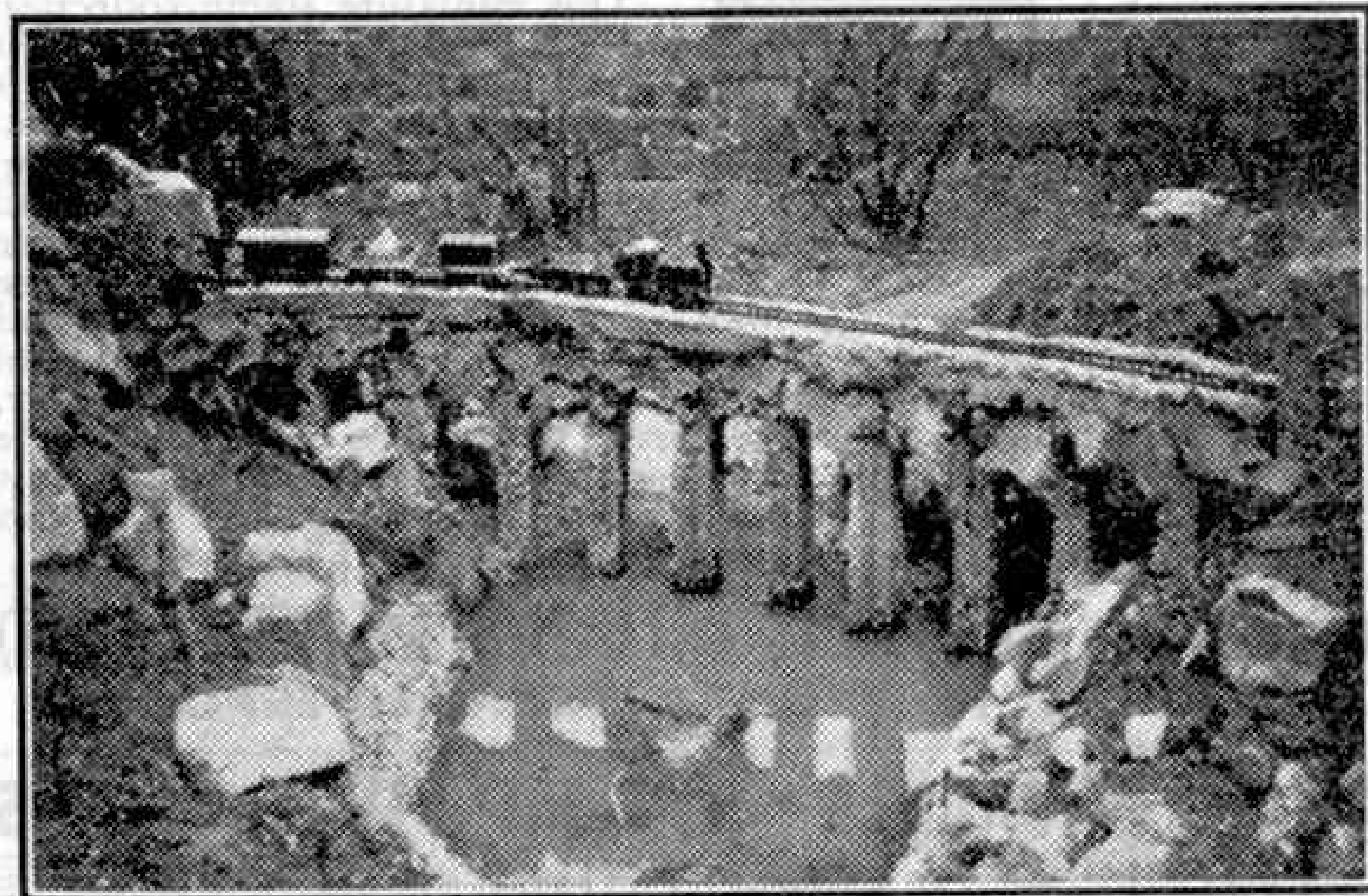
allows a "Canal" complete with a dummy power boat and two barges to be represented.

The other layout is situated in the front garden of its owner, Capt. M. B. Walker, Braunstone. This railway is known as the "*Caledonian and Hebrides Union Railway*" and is a single-line system. Quite appropriately the special character of the line is matched by its unusual railway buildings and other lineside features.

This is how the owner describes the railway: "After leaving Applecross on the coast, where travellers from the Hebrides entrain, the line travels by Glen Torridon, winding through Strath Glass before tunnelling towards Loch Garry viaduct. This eleven-arch miniature is based on the real Glenfinnan viaduct on the West Highland line from Fort William to Mallaig. Another tunnel takes the line to Black-

mile Pass, a mountain station with a branch over which merchandise is transhipped from the nearby 'Caledonian Canal.' The track returns down Glen Shiel and Strathcarron to Applecross. Here there are three platforms, a siding and a turntable.

"The view of the viaduct shows a typical mixed train including some pre-war Hornby stock headed by an 0-4-2T. This engine is a Hornby No. 1 Tank modified by a more ornate chimney."



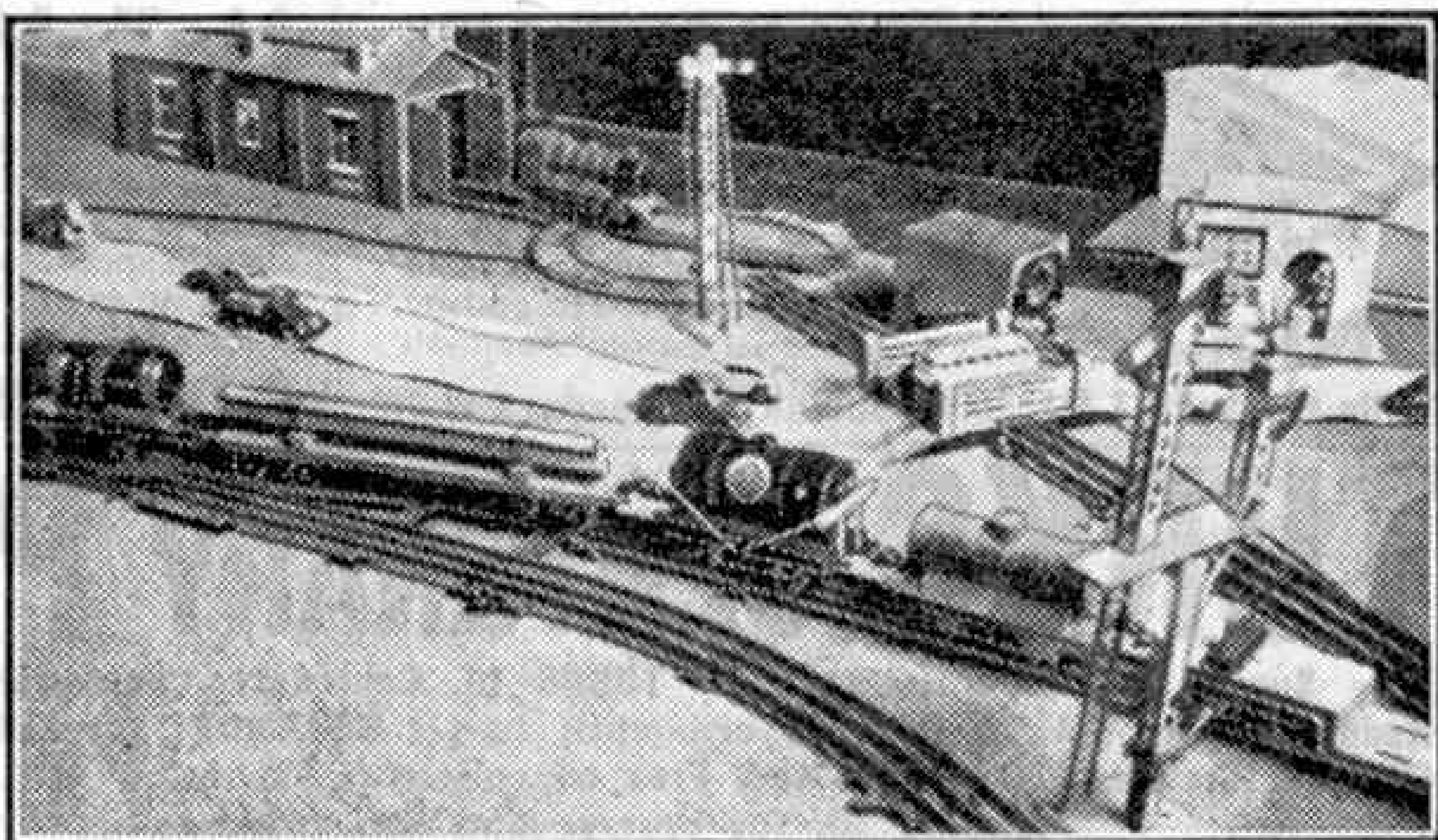
An outdoor concrete viaduct on the Hornby layout of Capt. M. B. Walker, Braunstone.

The other shows an outdoor Hornby system developed specially to represent a railway in the Scottish Highlands.

Special attention has been given on both these layouts to lineside features. Those of the indoor system can readily be varied according to layout requirements, in contrast to the more or less permanent "Highland" characteristics of the outdoor railway.

The indoor layout has a continuous main line with various sidings, and a short branch and turntable giving access to an engine shed. This line is owned and operated by our reader R. J. Maltby, Epsom Downs, who is fortunate in possessing a good selection of the Hornby stock available before the war. A large E220 Special 4-4-2 Tank is the principal engine, especially for passenger working.

Roads in the neighbourhood of the line are represented by lengths of paper cut to a suitable width and shape, coloured and laid out on the floor. The same scheme also



An indoor view of a Hornby layout. This is an electric system owned by R. J. Maltby, Epsom Downs.

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For other Stamp Advertisements see also pages 82 and xi.

Stamp Collecting

The Story of Newfoundland

By F. Riley, B.Sc.

NEWFOUNDLAND is specially interesting in the stamp world just now, for the island is about to become one of the provinces of Canada, and this can be taken to mean that its individual stamp history of 91 years will come to an end. The island has many claims to distinction. It was actually Britain's first colony, founded in 1583 by Sir Humphrey Gilbert, and it has been associated with such outstanding events as the completion of the first Atlantic cable, the pioneer experiments of Marconi, the founder of modern wireless telegraphy, and the earliest transatlantic flights.

The stamps of Newfoundland cover a very wide range, and tell us much about the island and its story. The practice of doing this through stamps began 83 years ago with the appearance of designs showing a codfish and a seal on an icefloe, and both cod and seal have been prominent on Newfoundland stamps at intervals ever since. The island is famous for fishing, for to the south are the inexhaustible Grand Banks, perhaps the greatest fishing ground in the world. The single codfish of the 1866 stamp appeared again in a different frame in 1880 and in a later issue, and in 1932 a whole pile of codfish came along on the 1c. stamp of that year's pictorial issue, a stamp that must be well known to every "M.M." reader. There was a different single fish in 1937, again on the 1c. value, and the pile returned in 1941-44. In various issues the Grand Banks fishing fleet also received recognition, while



seals and sealing fleets continued the story on stamps of Newfoundland's other famous maritime enterprise.

Fish and seals are not the only creatures for which Newfoundland is famous. Another is the caribou, the Arctic deer, which made its first appearance in 1897.



It was next prominent in the 1919 series, commemorative of the Newfoundland contingent in the first World War. Another caribou design appeared on the 5c. value of the 1932 issue, and this was repeated in 1941-44, while in the meantime the caribou had been the subject of the 7c. stamp of the additional Coronation issue of 1937. The salmon abundant in the rivers of Newfoundland received recognition on stamps of 1932, to reappear in later issues. The island's forests also have yielded stamp designs featuring logging and paper mills.

Many famous men have been associated with Newfoundland since John Cabot first sighted it in 1497. This event was commemorated in 1897 by a special



issue that also marked the Diamond Jubilee of Queen Victoria. A portrait of Cabot appeared on the 2c. value; Cape Bonavista, his landfall, was seen on the 3c. value, and his ship "Matthew" was shown leaving the Avon on a third stamp of the issue, which also included a portrait of Henry VII, who commissioned Cabot's voyage of discovery. The 450th anniversary of his achievement was celebrated in 1947 by the issue of a 5c. stamp showing the discoverer on board his ship off Cape Bonavista.

The next great name to be associated with Newfoundland was that of Sir Humphrey Gilbert, the famous Elizabethan sailor who took possession on behalf of Queen Elizabeth in 1583. Gilbert's portrait appeared on the lowest value of the issue commemorating the 350th anniversary of this event, and the remaining issues showed various scenes in connection with it, a portrait of Queen Elizabeth herself gracing the 24c. value.

Another British monarch to have his portrait on a Newfoundland stamp was James I. This appeared in 1910, in a set celebrating the colonization of the island by an expedition under John Guy, whose portrait appeared on one of the stamps of the issue, his ship and the arms of his company showing on others. One stamp of this issue carried the portrait of Sir Francis Bacon, the famous philosopher.

The 5c. blue stamp of December 1941 is yet another that carries the portrait of a famous man associated with Newfoundland. This is Sir Wilfred Grenfell, the great missionary of Labrador, which is on the mainland of North America but is part of the territory of Newfoundland.



And now we must turn to another aspect of Newfoundland stamps that is of outstanding interest of a more modern type. A guide to this is to be found on a stamp of 1931 that shows the routes followed on famous pioneer transatlantic flights from Newfoundland to Europe. The island was the natural starting place for these, which were made from west to east in order to take advantage of prevailing winds. With these flights the names of H. G. Hawker and M. Grieve, and of Sir John Alcock and Sir A. Whitten-Brown were associated. Hawker and Grieve were not successful, their aircraft failing in mid-ocean, but the two airmen were rescued

by a passing steamer. Alcock and Brown were successful two months later, in June 1919. In both instances stamps of Newfoundland with special overprints were used for mail carried on the flights. This practice was followed with later transatlantic flights, and one of the stamps of the "Publicity" issue of 1928 showed the aircraft of Alcock and Brown, a converted Vickers "Vimy" bomber, which also appeared, along with an early sailing packet, on a 1931 air stamp.



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For other Stamp Advertisements see also pages 80 and xi.

Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

PERHAPS the most interesting colonial novelty issued since these notes were last written has been the Malta set, which appeared overprinted "Self Government" on 25th November. Only older collectors will remember the furore created when Maltese stamps were similarly treated some years ago. Many of these latter stamps are valuable to-day, so it is



only natural that there has been a big rush to obtain specimens of the new stamps. The overprint is in black on some values and red in others, and whereas collectors can hardly expect these stamps to become as scarce as the previous ones have done they will cer-

tainly be worth collecting from an investment point of view.

Egypt generally manages to keep in the stamp news and has done it again by issuing on 10th November a 10 mills stamp in honour of Ibrahim Pasha, who was an ancestor, the great-great grandfather to be exact, of the present King of Egypt, King Farouk. It is just possible that there are one or two readers of the "M.M." who are as ignorant as to the identity of the Pasha as was the writer of these notes before looking the matter up. Anyhow, he is credited as being the builder of modern Egypt, which is one way of describing a warrior. The stamp is quite handsome and typical in design of modern Egyptian stamps.

One result of the cancellation of the King's visit to Australia and New Zealand was the cancellation also of the two sets of stamps that were to have been issued in honour of the event. Maybe there are enough new stamps anyhow, so a couple of sets won't be missed. It is not generally known what the designs were to have been for the Australian set, but pictures of those for New Zealand were published, and two of the four stamps at least looked pretty moderate, though they could hardly have been as poor as those recently issued for Bahamas.

A sheet of the 2½d. "Silver Wedding" stamps overprinted for use in Tangier has been found with the overprint misplaced. This has resulted in the six stamps of the top row being without an overprint at all, and the rest of the stamps in the sheet have the overprint at the top instead of the bottom. Two collectors want to know what is the philatelic value of these latter stamps, and there may be others who are wondering. To be quite candid, precious little. The two top rows of the sheet, which will have one stamp in each pair without an overprint at all, are interesting enough, but the rest are small fry indeed, for it is not likely that



Gibbons will ever catalogue them, and after the novelty has worn off interest will mostly die away.

These particular stamps have been mentioned to illustrate a point of considerable interest at the moment, with so many varieties flying about. Hitherto few errors

have cropped up on British stamps, but recently several have appeared, such as the two sheets of "Olympic Games" stamps with the

double overprints; and while in pukka errors of this special type—we say pukka, for many so called double overprints are actually nothing of the kind—we have a philatelic variety that is of major importance and thus is valuable, such a thing as a misplaced overprint is something entirely different, and whatever price these items bring in the first place they ultimately find their true level. Those who have rushed in and paid a fancy figure will rue their bargains later on.

Australia issued a winner when the "Scout Jamboree" stamp appeared on 15th November. It is a pity that the stamp wasn't a bit larger, for the design is attractive enough, though the colour is dingy red, and the fact that it was printed on watermarked paper is interesting, in view of the recently issued Princess Elizabeth stamp, which is now on unwatermarked paper.

The stamp appeared in plenty of time for use in the special post office opened on 29th December at the Wongo Park Camp. Many Boy Scouts are keen stamp collectors, and they must feel honoured at

the philatelic attention their craft receives. There is news that the Philippine Republic plans to issue two stamps shortly to commemorate the 25th anniversary of their own Scout Association.

Figures have been issued by our postal authorities of the numbers of "Wedding" stamps which were sold. Apparently the figure for the £1 value was 419,628 copies. One or two contemporaries have stated that this is not a substantial quantity, and that in consequence

the stamps will turn out scarce. We don't believe it, for there was hardly a collector who didn't buy from a single copy to a few sheets, and most of these will find their way back on to the stamp market one fine day. There are relatively few used about, which helps to prove how many are held for speculation. At the same time, the fact that the public did not use many for ordinary commercial postage does not mean that a £1 stamp is not needed. It takes the public a long time to adopt a new value, no matter how useful. An instance of that is the 11d. stamp. Used copies are scarce, yet parcels are still being sent with two stamps to make up 11d. postage.

We seem to have talked about nothing but our own British or colonial stamps this month, but it is just these stamps which engage the attention mostly of collectors who are likely to read these notes. One dealer tells us that all his young customers to-day demand colonial stamps, but we cannot overlook the attractive Dutch Child Welfare set which came out in November.



"Aircraft Annual 1949"—(Continued from page 62)

romantic story of their development from a struggling little airline operating over a 90-mile route to the largest international airline in the world, with 92,000 miles of air routes linking the United States with every continent.

The ever-increasing growth of air transport and the economic necessity of carrying the maximum payload on every journey has caused serious attention to be given to the possibilities of refuelling aircraft in flight. In this process the machine takes off with only partly-filled fuel tanks but with a greater load of passengers or freight than it could lift if the tanks were full; and when fully airborne and at a pre-determined height it is refuelled by flexible pipeline from a tanker aircraft flying overhead. Sir Alan Cobham, another great pioneer of flying and to-day Managing Director of Flight Refuelling Ltd., relates the history of this interesting development, from the first known effort at refuelling in the air, made in November 1923 at a carnival at Kelly Field, U.S.A., to the highly successful flight refuelling carried out on the North Atlantic service between London and Montreal in the winter of 1947.

A detailed description of the Boeing "Stratocruiser," the civil version of the C-97 "Stratofreighter" war cargo and troop transport, gives a vivid insight into the structural details and luxurious passenger equipment of a modern 4-engined air liner. Another chapter deals with the measures taken to make flying as safe as humanly possible. We are told about the numerous safety regulations, the fog dispersal systems employed to enable aircraft to take off from, and land at, airports obscured by fog, and of the great part played by radio, and more recently radar, in helping to overcome the hazards of flying. C. W. Cain, who edited *"The Aeroplane Spotter"* from 1944 until it ceased publication in July last year, has some interesting things to say on the fascination and value of being able to identify aircraft on sight. Even the philatelist who is airminded is not forgotten, for there is an interesting chapter on air mail and air commemorative stamps.

The many half-tone photographs illustrating the text add greatly to the interest of the Annual, and its value is further increased by a large folded sheet at the end giving specification details of current types of British and foreign civil and military aircraft.

A Visit to "Waterloo Box"—(Cont. from page 69)

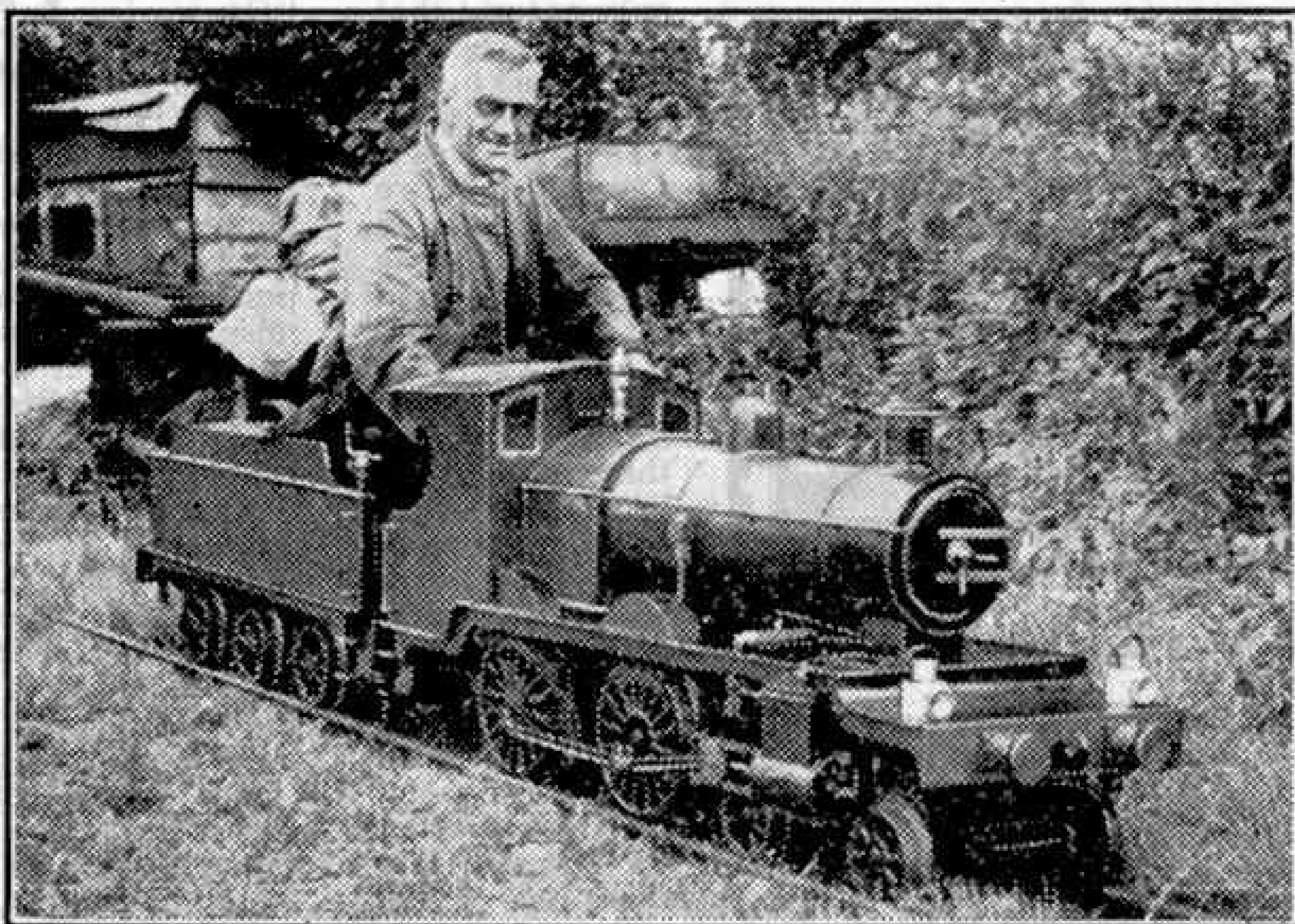
signalmen that the train standing at a particular platform is ready to go. Then a few seconds later the route has been set up, and within a minute or two the end vehicle has passed the Box and the procession of lights along the track diagram records the train's passage outward.

On an afternoon busy with early summer traffic I was able to see how smoothly everything worked. Suburban electrics came and went without concern. There were Portsmouth and West of England arrivals, empty stock for disposal, further empties to form outgoing departures a little later on. Light engine movements were a necessary accompaniment and the usual manoeuvres when vans arriving by passenger train had to be shunted from one road to another. To add to the pressure there were incoming "Union Castle" Boat Specials, and I saw one of those very important-looking "Queen Mary" Boat Specials leave for Southampton. Fittingly enough, a "Merchant Navy" 4-6-2 sailed out with this train, while the Bournemouth and West of England traffic was

divided between hard-slogging "King Arthurs" and stately "Nelsons." A motley collection handled the empties, including a Drummond "Hopper" 4-4-0, the inevitable "M7" 0-4-4Ts, a Maunsell "Mogul," and just one little "foreigner"—a Wainwright 0-4-4T from the neighbouring Eastern Section.

All this movement, however, was taken as a matter of course by the Box staff. Practice makes perfect we know, but the nature of the Waterloo apparatus and its reliability gives the operators a quiet confidence that makes the job look easy.

The lower floor of this remarkable Box is as impressive in its way as the "upper deck." Here are located the very vitals that ensure that the points and signals carry out the signalman's wishes and that, contrariwise, the indicator lights on the control



Mr. Richard Small, of Cookham Dean, Berks., with his steam 4-4-0. It weighs 8 cwt. and can travel at 18 m.p.h. Photograph by "Loral."

panels wink their message unfailingly to the operators. In neat rows, on shelves as it were, are glass-cased relays, fuses and so on, doing their intricate job, silently and unattended, while sinister-looking black cables appear to writhe snakily in the background. There are in fact 728 relays, over 1,500 fuses and several thousand lever and relay contacts. In addition the Box contains 110 miles of wire in interlocking, selection, points control, track locking and diagram circuits, as well as 30 miles of wire for telephones.

The maintenance specialists who attend to this remarkable installation, who should know, hold that "nothing much ever goes wrong with it."

THE JOHNSON 'WELLCOME' PHOTOGRAPHIC YEAR BOOK

The Burroughs 'Wellcome' Photographic Year Book has been taken over by our advertisers, Johnsons of Hendon Ltd., the well-known makers of photographic material, and the 1949 issue appears under the above title.

All the familiar features that have made the year book so valuable to photographers in the past have been retained. In addition to the diary and the pages for recording exposure details, there are monthly light tables and the Wellcome 'Exposure Calculator,' the value of which has been amply proved by the experience of thousands of amateur photographers since they were introduced many years ago. Information is given on 'Tabloid' photographic products, and there is a new section describing some of the popular Johnson photographic chemicals and equipment. A new feature is a depth of field calculator that should be highly appreciated by photographers.

The price of the book is 5/-, including purchase tax.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Find These Station Names

Many railway stations have curious names, and these are always of the greatest interest to enthusiasts. This month we have a competition in which British stations with unusual names form the central feature. Entrants are asked to find the names from the clues in the panel in the centre of this page. They are 12 in number, and each should lead to the name of a British railway station that is not merely a place name, but can have some other meaning. In each case the region of British Railways in which the station is to be found also must be stated.

Entries in this contest can be written on a postcard, or on a single sheet of

1. Where monks live among the trees.
2. Shuttlecock play.
3. Fought during war.
4. Entrance to the woods.
5. Found on a crane.
6. Famous trains.
7. Stone edifice.
8. Girl's name.
9. Royalty often passes through.
10. Trees at the top of the mountain?
11. Rivers and many streets have them.
12. Both seen on some streets (two words).

paper, and they should be addressed to "February Stations Contest, Meccano Magazine, Binns Road, Liverpool 13." If there is a tie for any one of the prizes to be awarded the judges will take into consideration the neatness and novelty of the entries concerned.

There will be the usual two sections in this competition, for Home and Overseas readers respectively, and in each prizes will be awarded of 21/-, 15/- and 10/6 for the best entries in order of merit. In addition consolation prizes will be given for good efforts that

fall just short of the prize winning standard. Closing dates: Home Section, 31st March; Overseas Section, 30th July.

Choosing an Engineering Career

Readers of the "M.M." are deeply interested in engineering, and many of them must have dreams of becoming engineers themselves. Such ambitions are good, for the world certainly needs its engineers, whose victories in many fields have been of the greatest benefit to all of us. This will be realized at once from the following list of some of the branches of the engineering profession: 1. Civil; 2. Mechanical; 3. Electrical; 4. Mining; 5. Aeronautical; 6. Marine; 7. Oil; 8. Chemical; 9. Railway; 10. Shipbuilding.

This list covers only part of the ground in which engineering plays a part, but it is long enough to form the basis of a competition that we feel sure will be attractive to our readers. What we wish them to do is to decide for themselves which branch of the profession they would enter if they had the opportunity of becoming engineers when they grow up, and to give the reasons that would guide them in making their choice.

It is not necessary to give long explanations. Indeed entries must be kept within 100 words, a length that should be sufficient to enable the reasons to be given briefly but clearly, whether these are based on personal inclinations or aptitude, or on the special attractions and value of the branch that is chosen.

Entries in this contest will be judged on their merits as explanations; the actual choice of a competitor will not be taken into account. Readers in the Home Section have until 31st March to make their selections and summarize their reasons to keep their account within the limit of 100 words, and the closing date in the Overseas Section is 30th July. In each of these sections there will be prizes of 21/-,

15/-, and 10/6, for the three entries judged the best, and other good attempts will earn consolation awards for their writers.

Entries in this contest must be addressed "Engineering Choice Contest, Meccano Magazine, Binns Road, Liverpool 13." They should be written on one side of each sheet of paper used, and competitors must not forget to write their full names and addresses on them.

February Photographic Contest

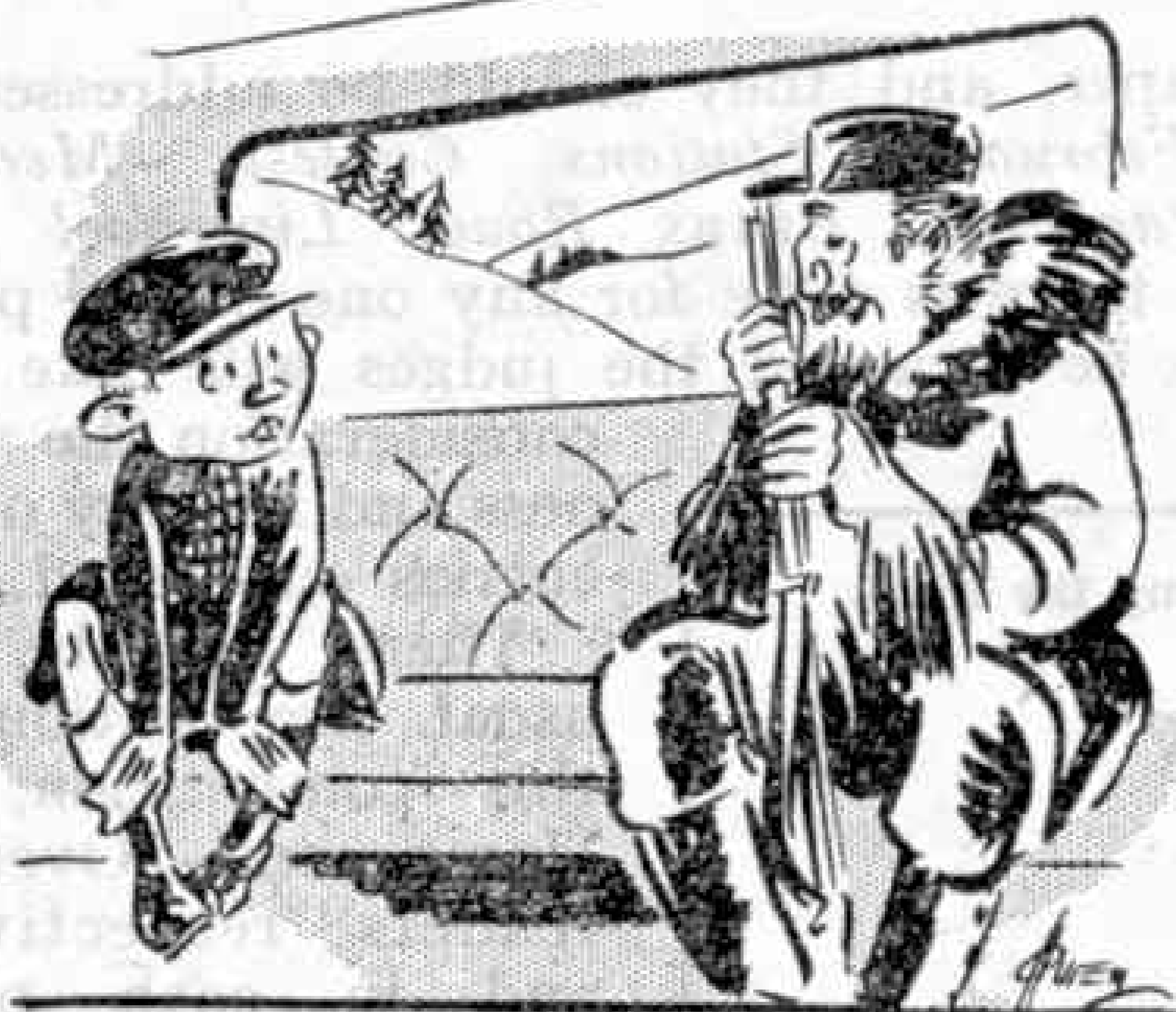
For the second of our 1949 Photographic Competitions we return to a special subject. We have just passed the depth of winter and there have been excellent opportunities for taking snow pictures, while others are possible during February, which has often provided us with intense frosts and severe snowstorms in the past. Readers therefore are asked to send in prints of snow scene photographs they have taken. There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate sections for overseas readers, and in each section prizes of 21/-, 15/- and 10/6 will be awarded.

Entries should be addressed "February Photographic Competition, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 28th February; Overseas Section, 30th June.

Fireside Fun

"Which of you broke my window?"
 "It was 'im, mum. He ducked when I threw a stone at 'im."



"You hunt bear, Sir?"

"No. Always wear this hunting outfit."

"Look here. The feathers are falling off this stuffed owl you sold me."

"Well, sir, this is the moulting season, you know. That shows you how life-like our stuffed owls are."

"There's no house in that picture. Why is it called 'Home'?"

"No place like it, I suppose."

"I'm not going to work for Mr. Smith after what he said to me."

"What did he say?"

"You're fired."

"Why are you late this morning, Smith?"

"Please sir, I fell downstairs."

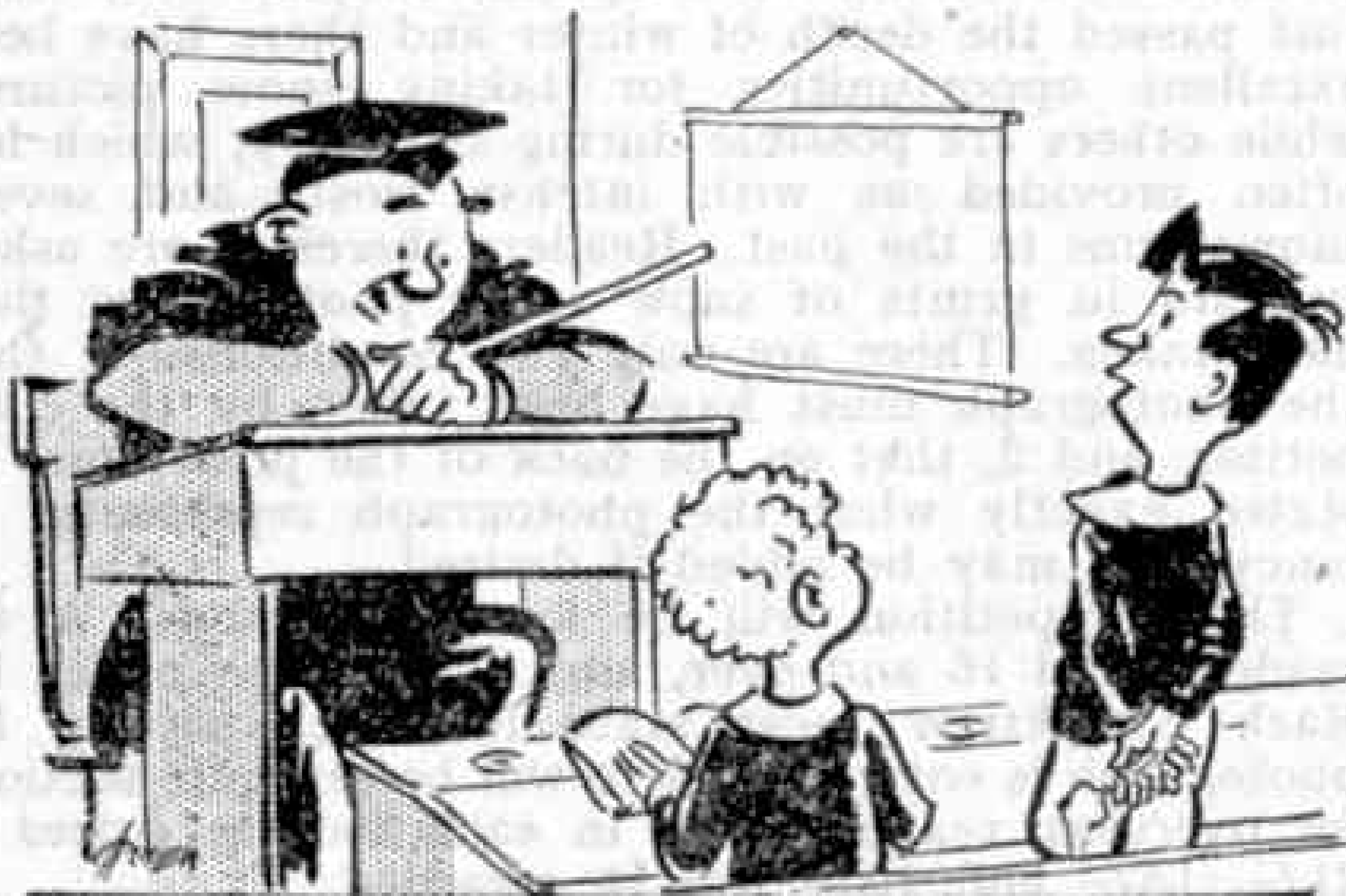
"That's no excuse. Falling downstairs is quick, so you should have been early."

"What's that you are putting on the bacon?"

"Lux."

"Whatever for?"

"Well, the advertisements say it stops shrinking."



"Father says I'm slow but sure."

"That's true. You're slow to learn and sure to forget."

BRAIN TEASERS

DON'T LOOK AT THE SCORING BOOK

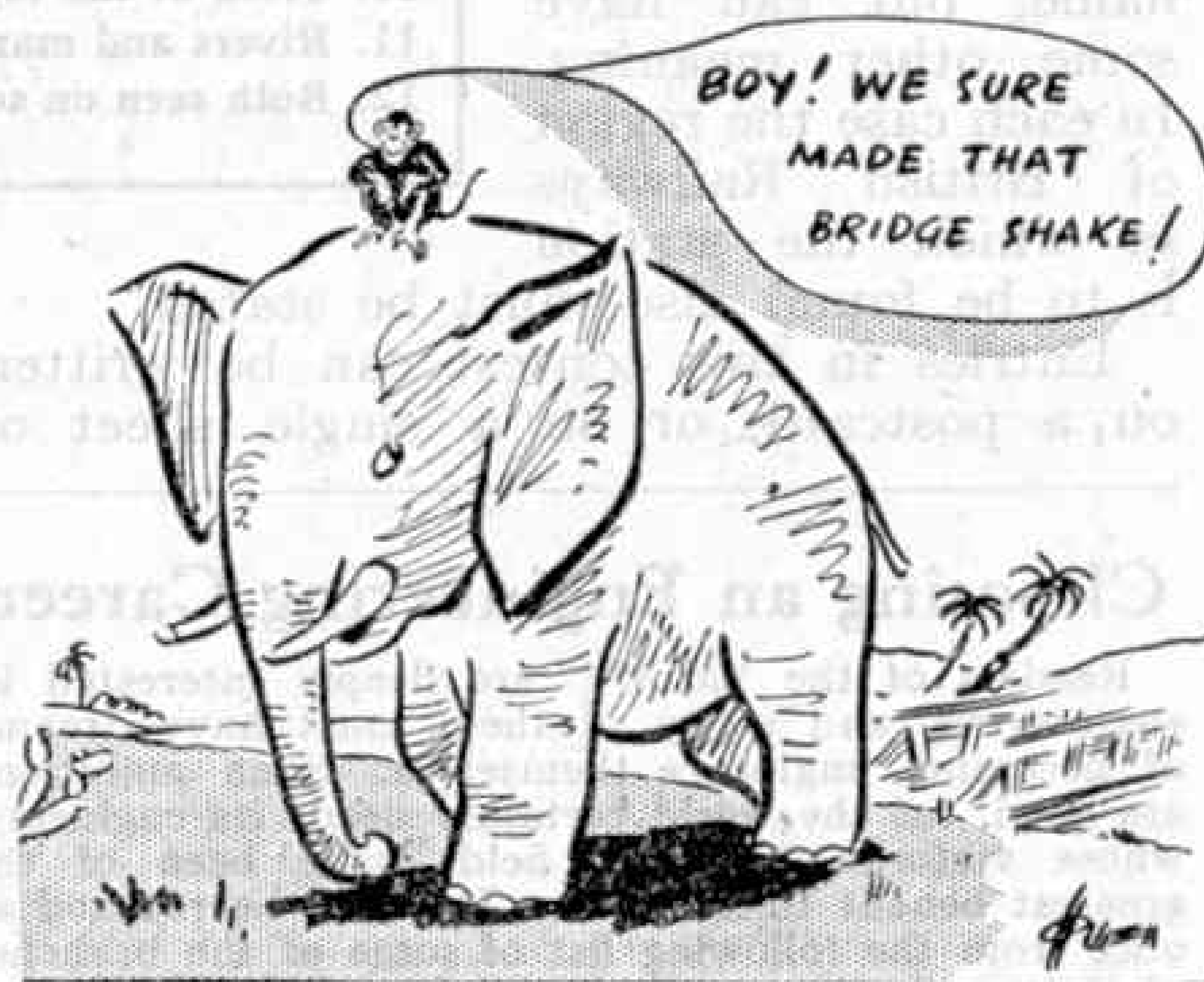
In a cricket match Arthur made 42 runs. Charlie made half as many as Bill, and Dick's score was a third of Bill's. Arthur's score exceeded Bill's by the same number as Charlie's exceeded Dick's. How many runs did each make? S.W.C.

MOVIES MOVED ABOUT

Recently I had a good week at the picture houses. On Monday I saw LEROVI SWITT; on Wednesday I saw HET YAW OT ETH TRASS; on Friday the picture was FELI TWIH HATFER, while next day I saw both NELALF DOIL and LUBLREGHFITS. What did I see? B.N.G.V.

WHO'S WHO IN DIZZY VILLAGE

I was recently amused to find that the doctor, the baker, the butcher and the porter at the railway station in our village are named Porter, Baker, Butcher and Doctor, but none of these men have names corresponding to their daily work. For instance Mr. Doctor is not the doctor; he isn't the baker either; and Mr. Porter is not the butcher. The porter and Mr. Butcher are great friends, but Mr. Porter hates the doctor, while Mr. Baker and the butcher meet in a friendly way whenever they can. Who is who in this remarkable mix-up? B.I.N.



SOLUTIONS TO LAST MONTH'S PUZZLES

The eight makes of motor car in our first puzzle last month were MORRIS, HILLMAN, STANDARD, AUSTIN, LAGONDA, ARMSTRONG SIDDELEY, HUMBER and BENTLEY. Start at M in the third row and follow the Knight's move at chess.

Our second puzzle was really a catch. A furlong is 220 yds., so that the guard's van would enter the tunnel as the engine left at the other end. The speed of the train has nothing to do with it.

The solution to our third puzzle is:

24691358

9

22222222

The word asked for in our last puzzle was ARE. On adding the letter A we get the word AREA.

THIS MONTH'S HOWLER

An orchid is where apples grow.

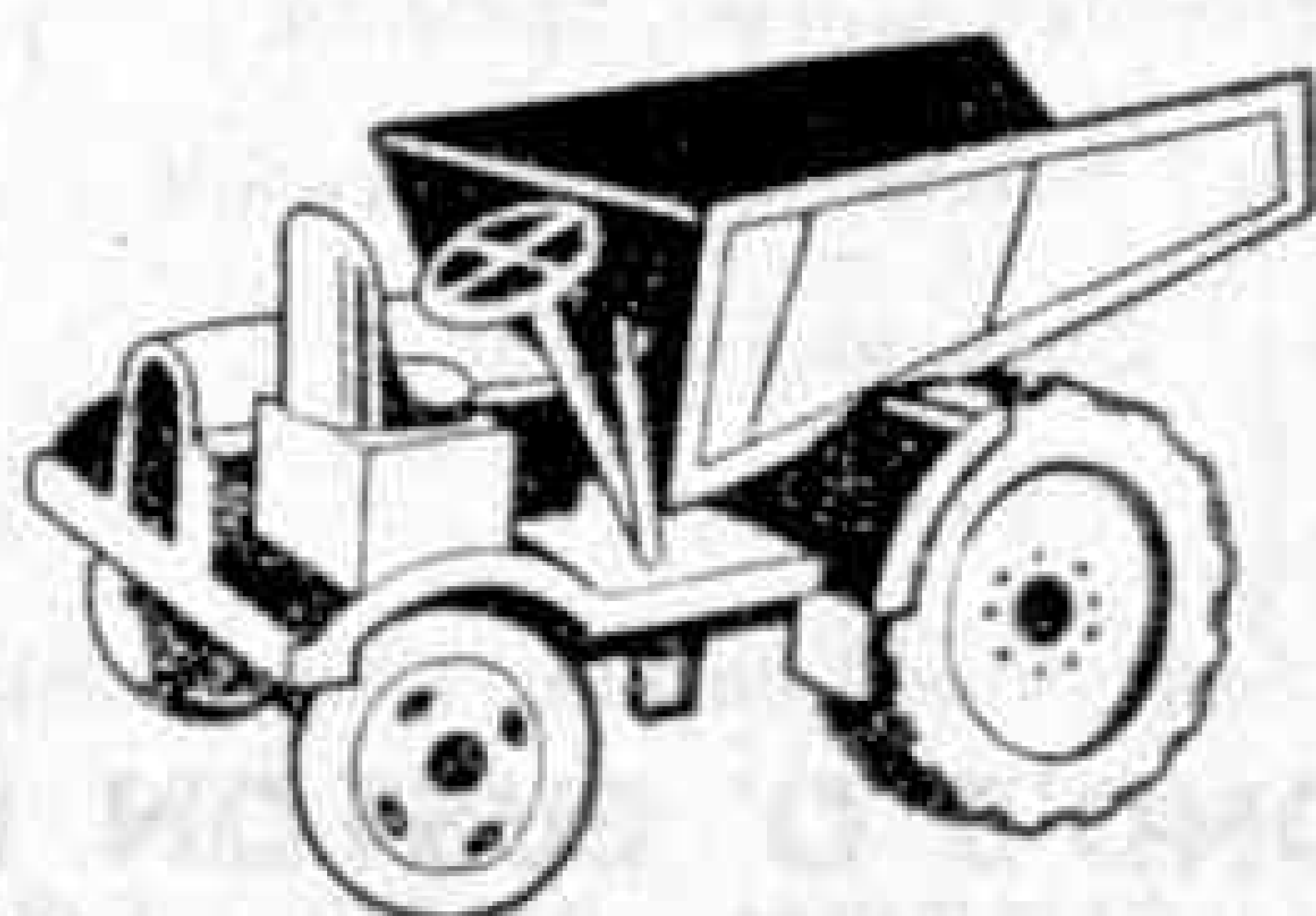
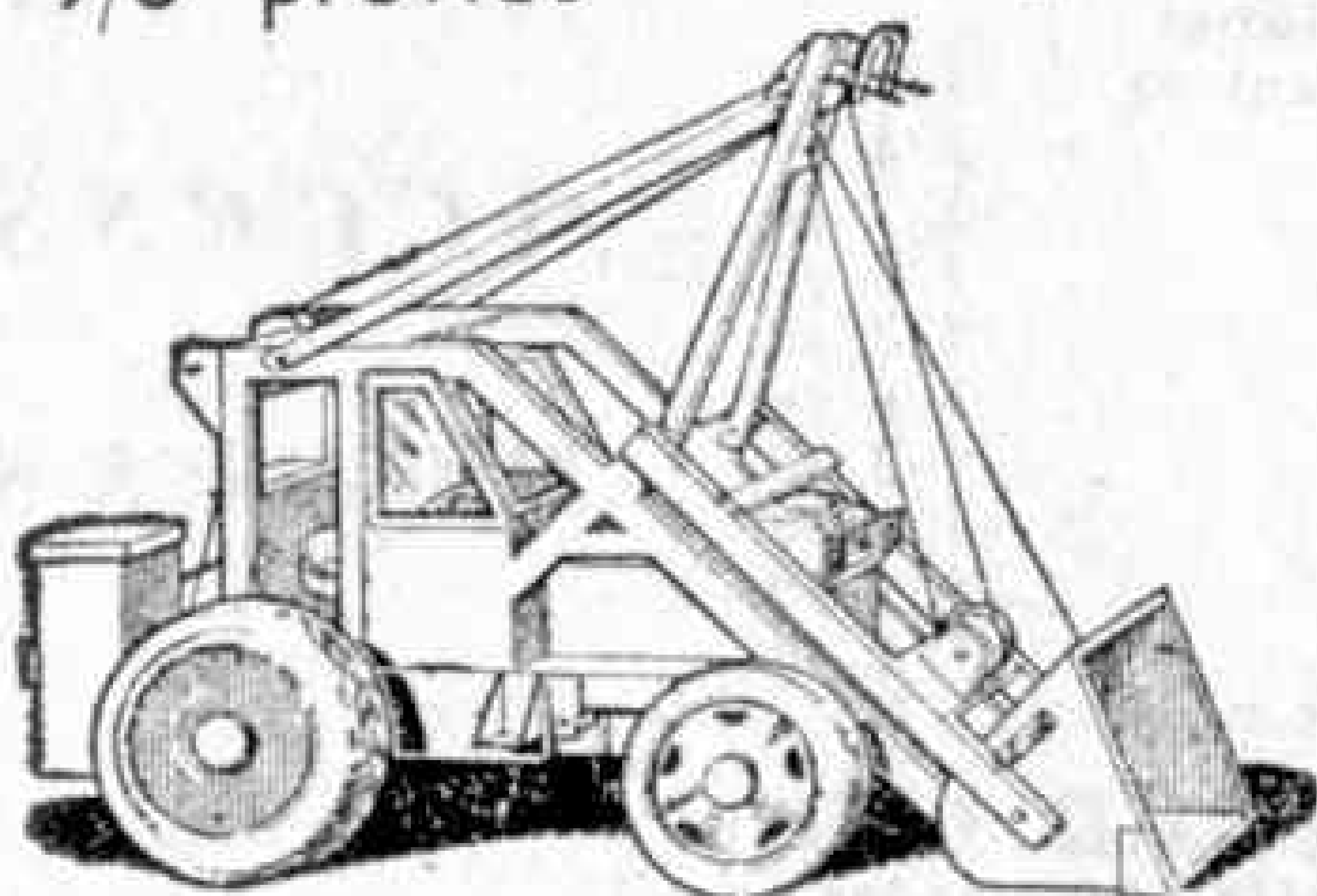
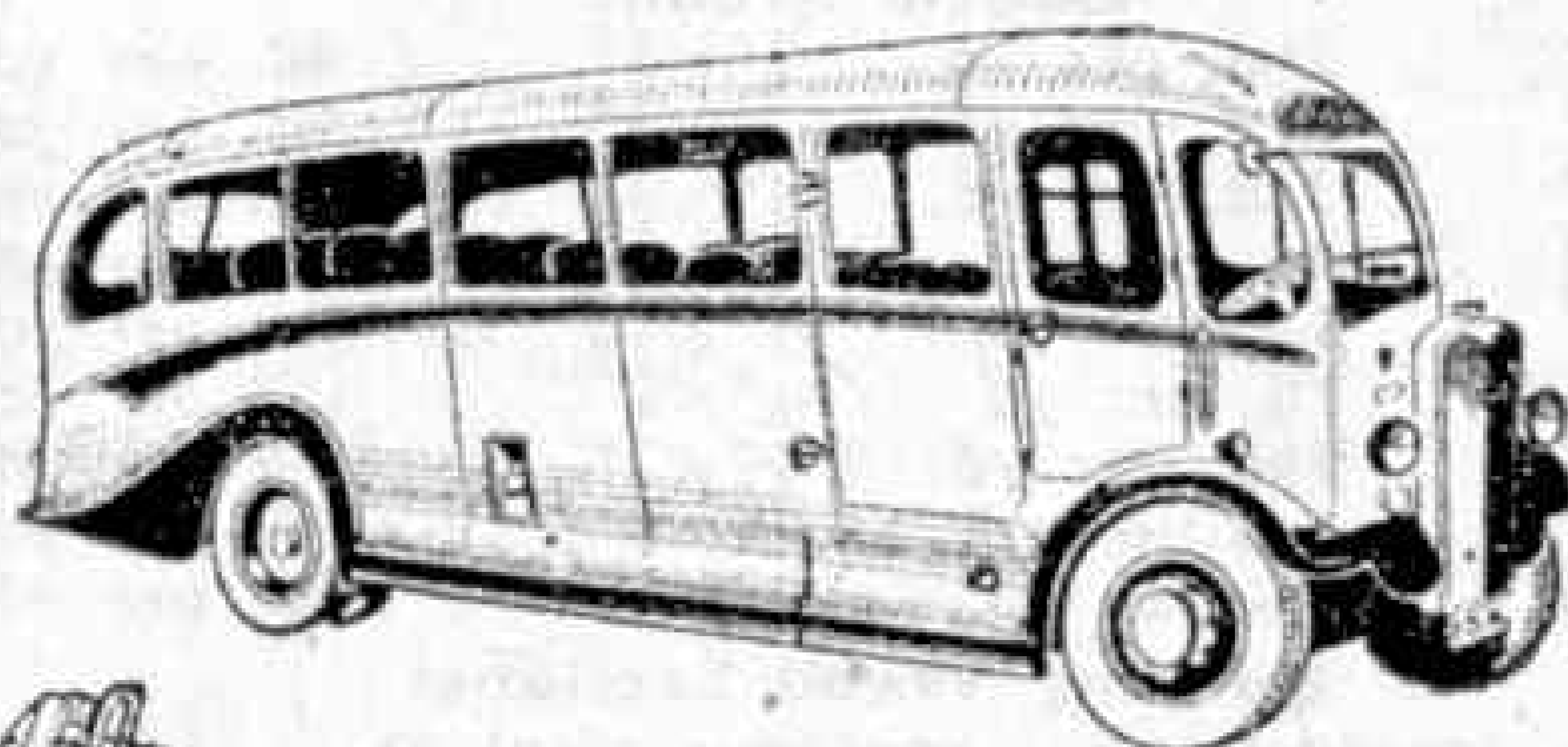
Make them with one of **HOBBIES**

BRITISH FRETWORK OUTFITS

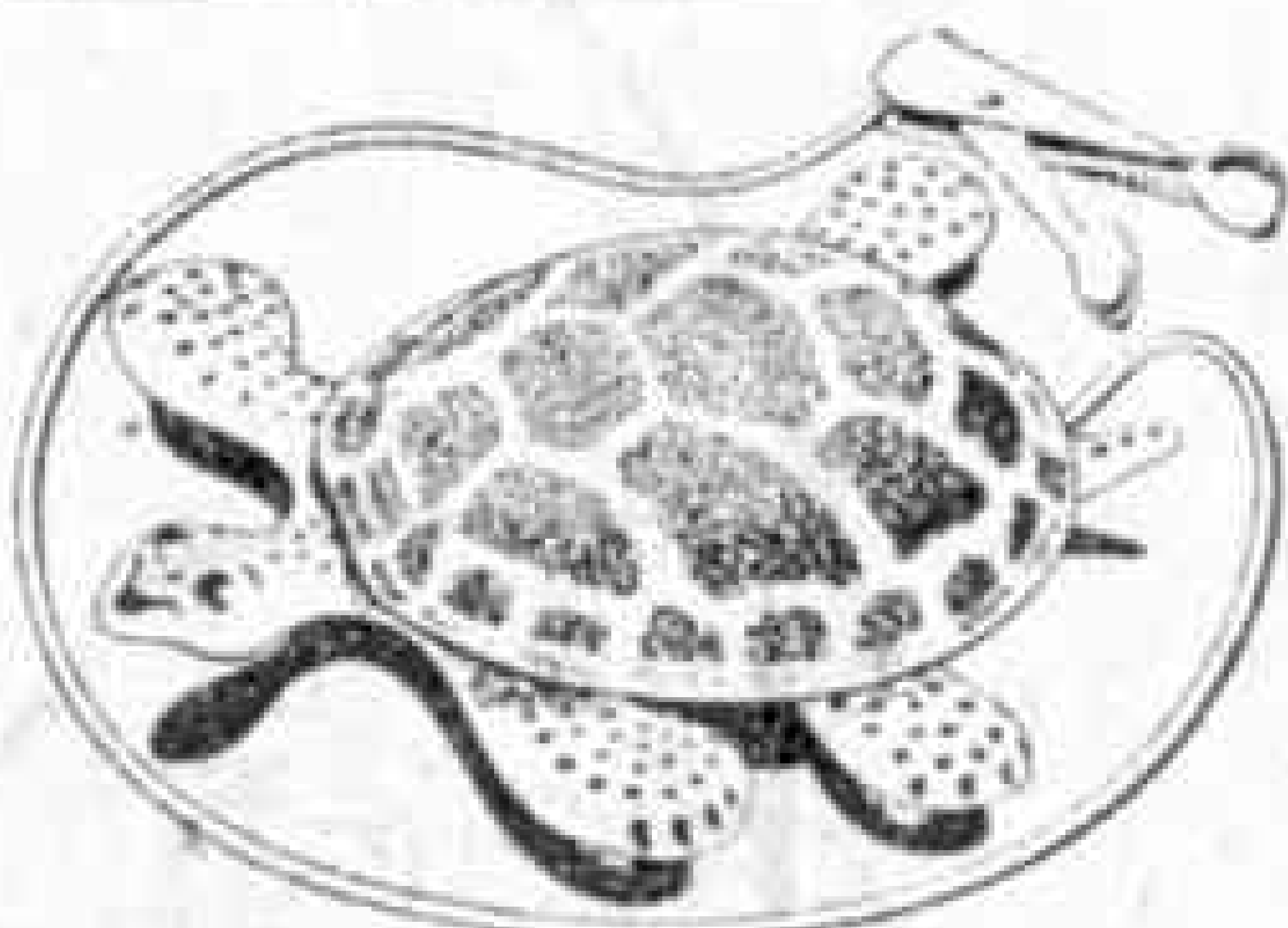
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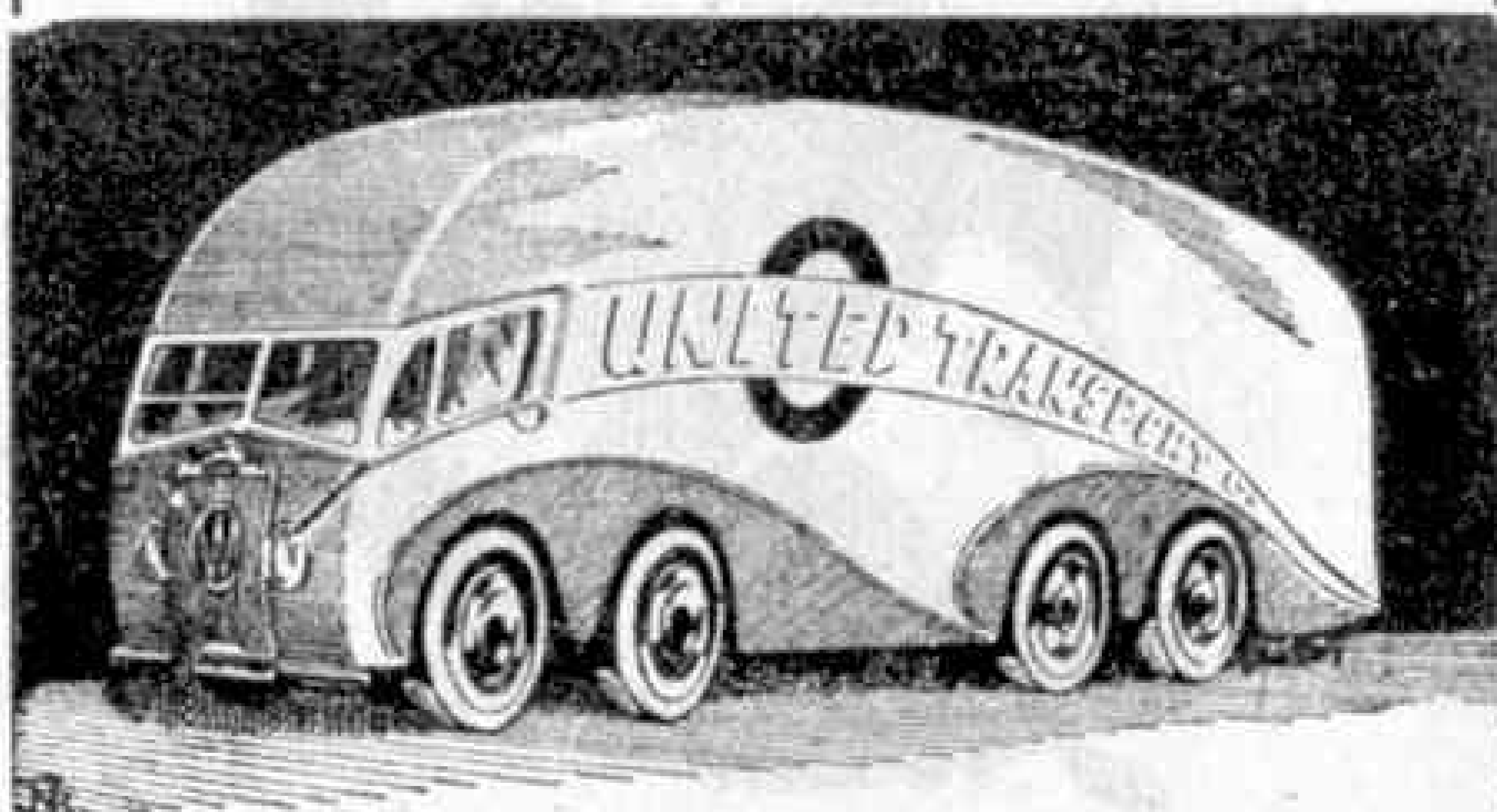
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1, GREAT WINCHESTER ST., LONDON E.C.2

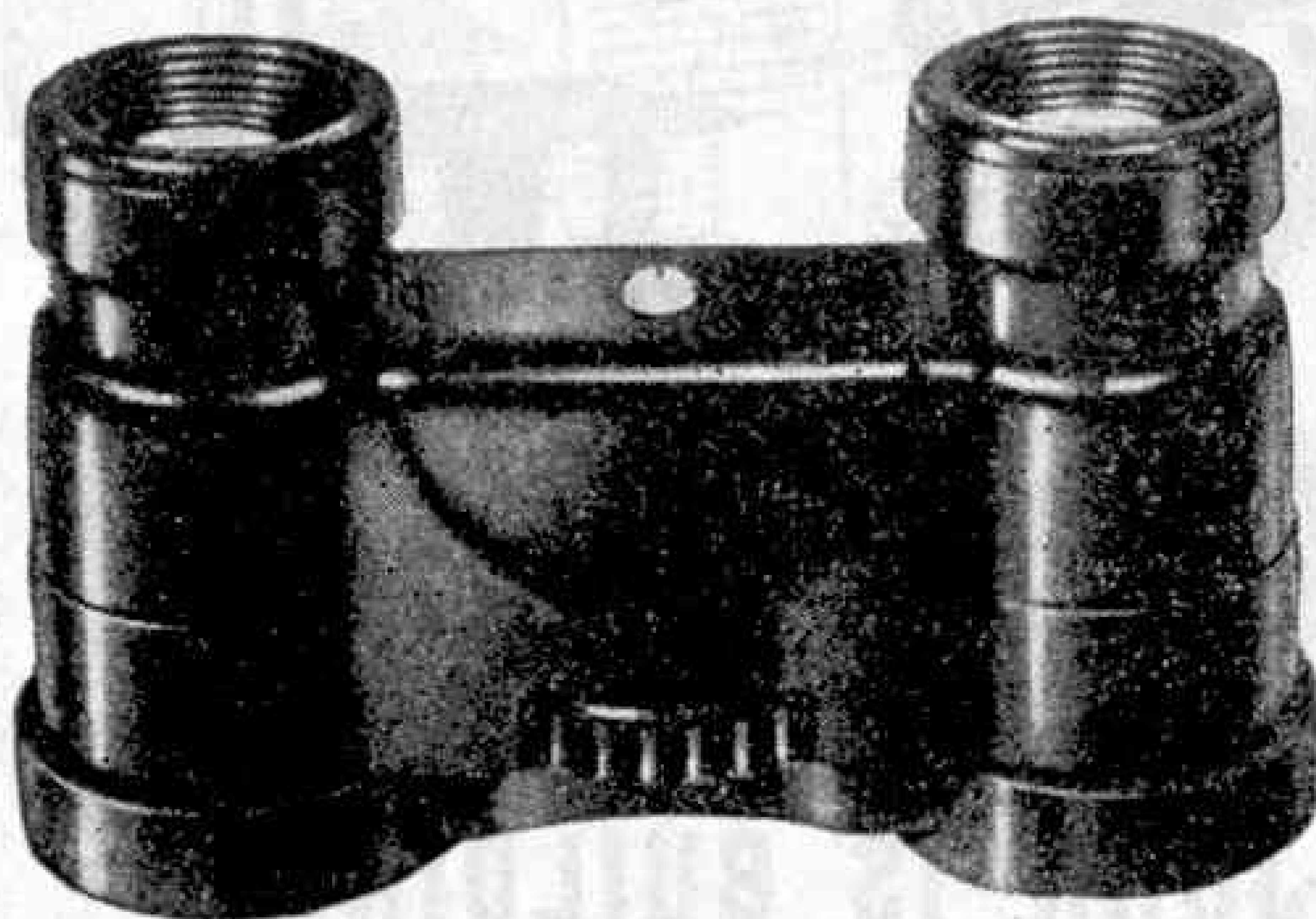
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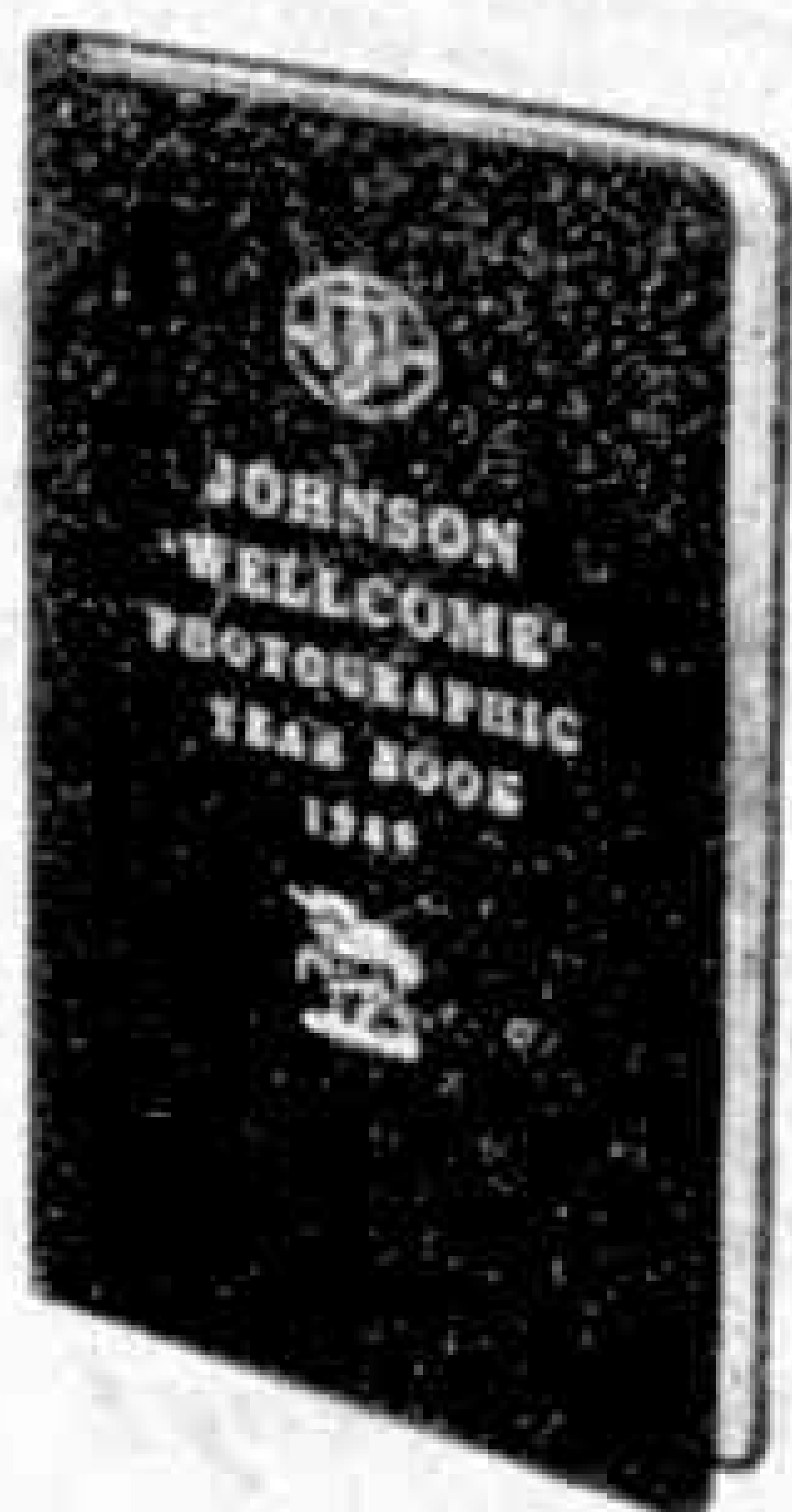
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JOHNSON-'WELLCOME' PHOTOGRAPHIC YEAR BOOK

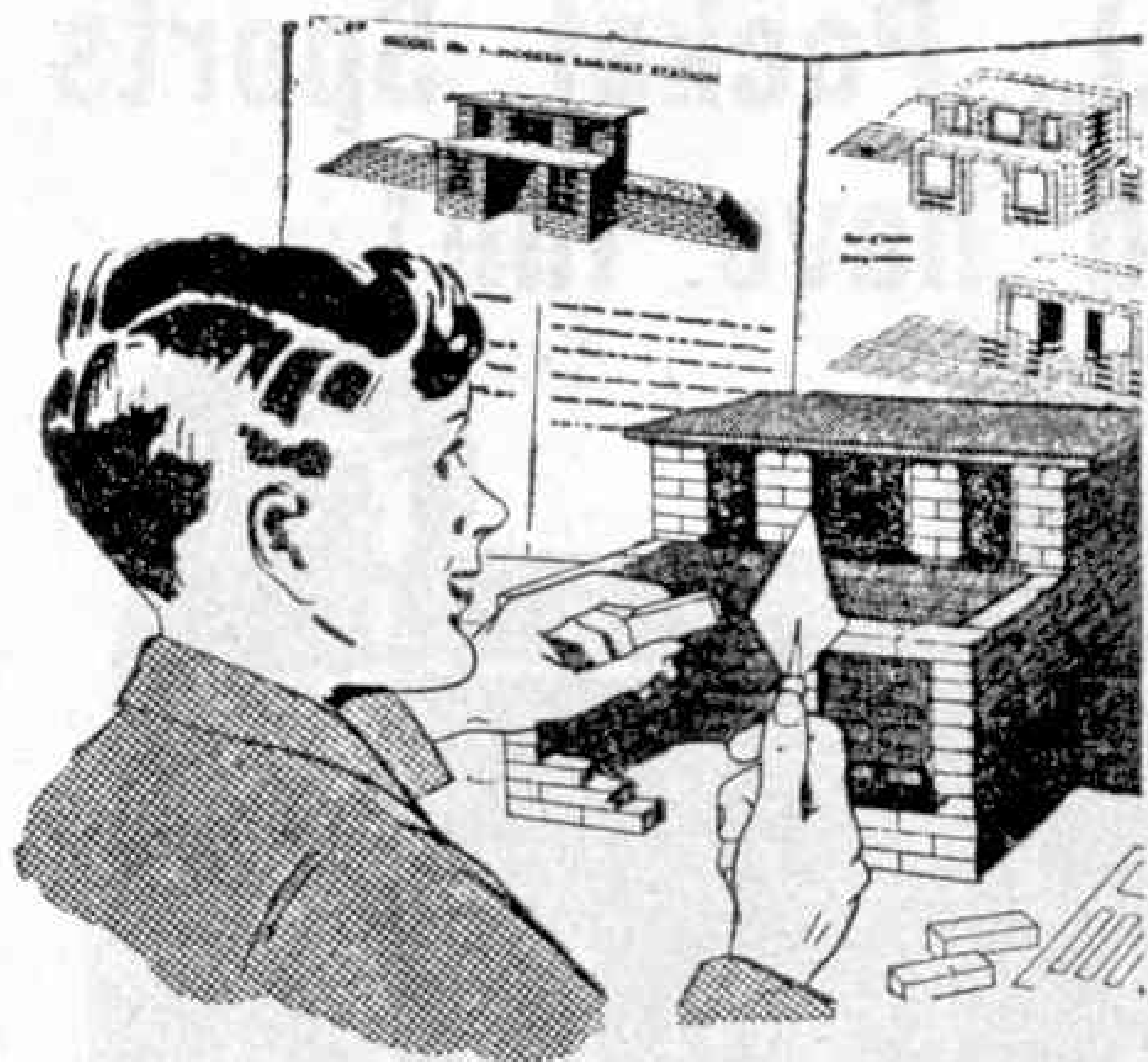
A perfect pocket compendium for the amateur photographer. Exposure and depth-of-field calculators with movable discs, marked in bold, clear figures. Diary for 1949. Memorandum and exposure record sections as well as 116 pages giving the fullest photographic information to enable you **PRICE 5/-** to get good pictures. (Inc. purchase tax)

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ESTABLISHED 1743



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|--|----------|
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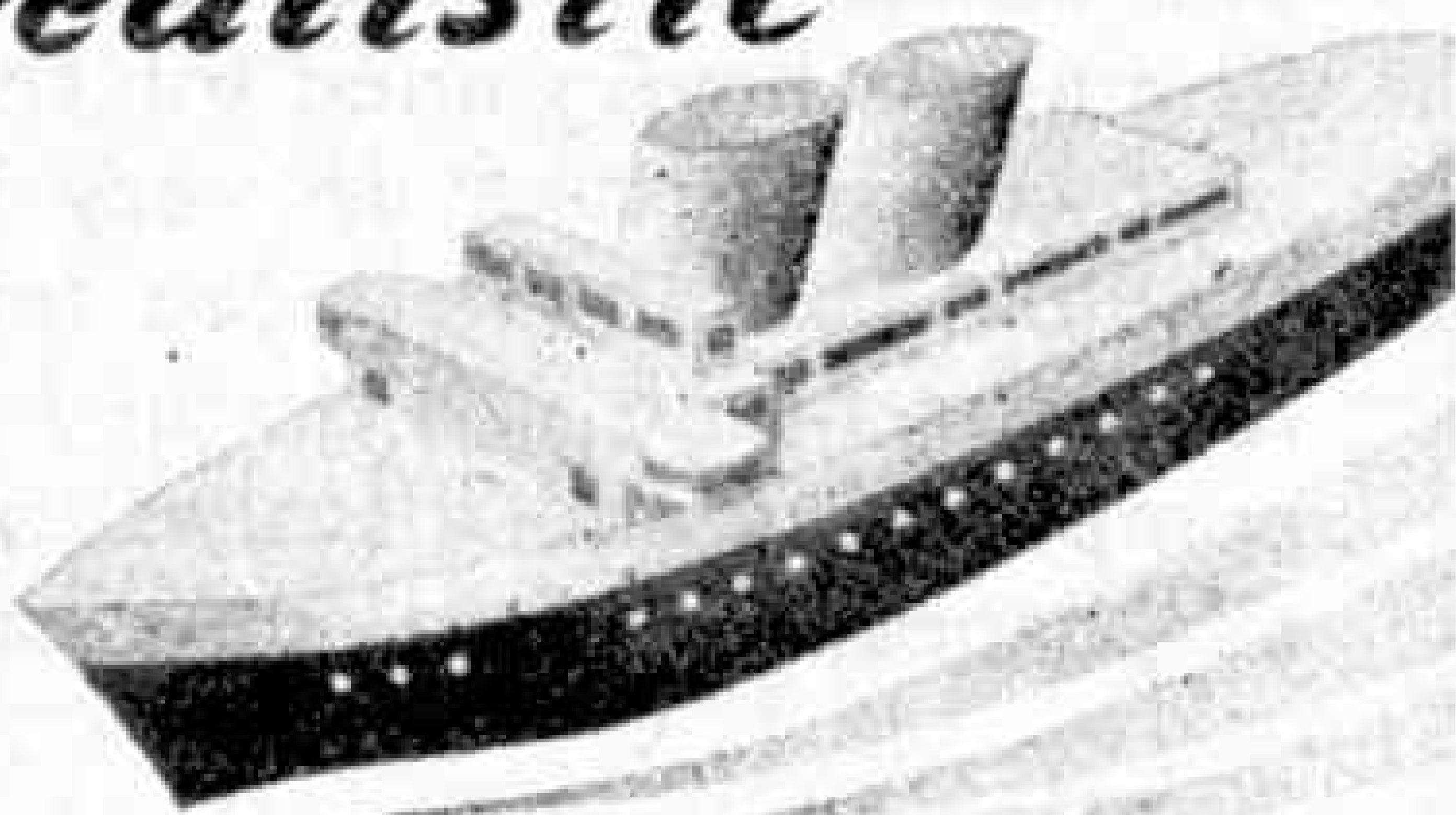
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1949

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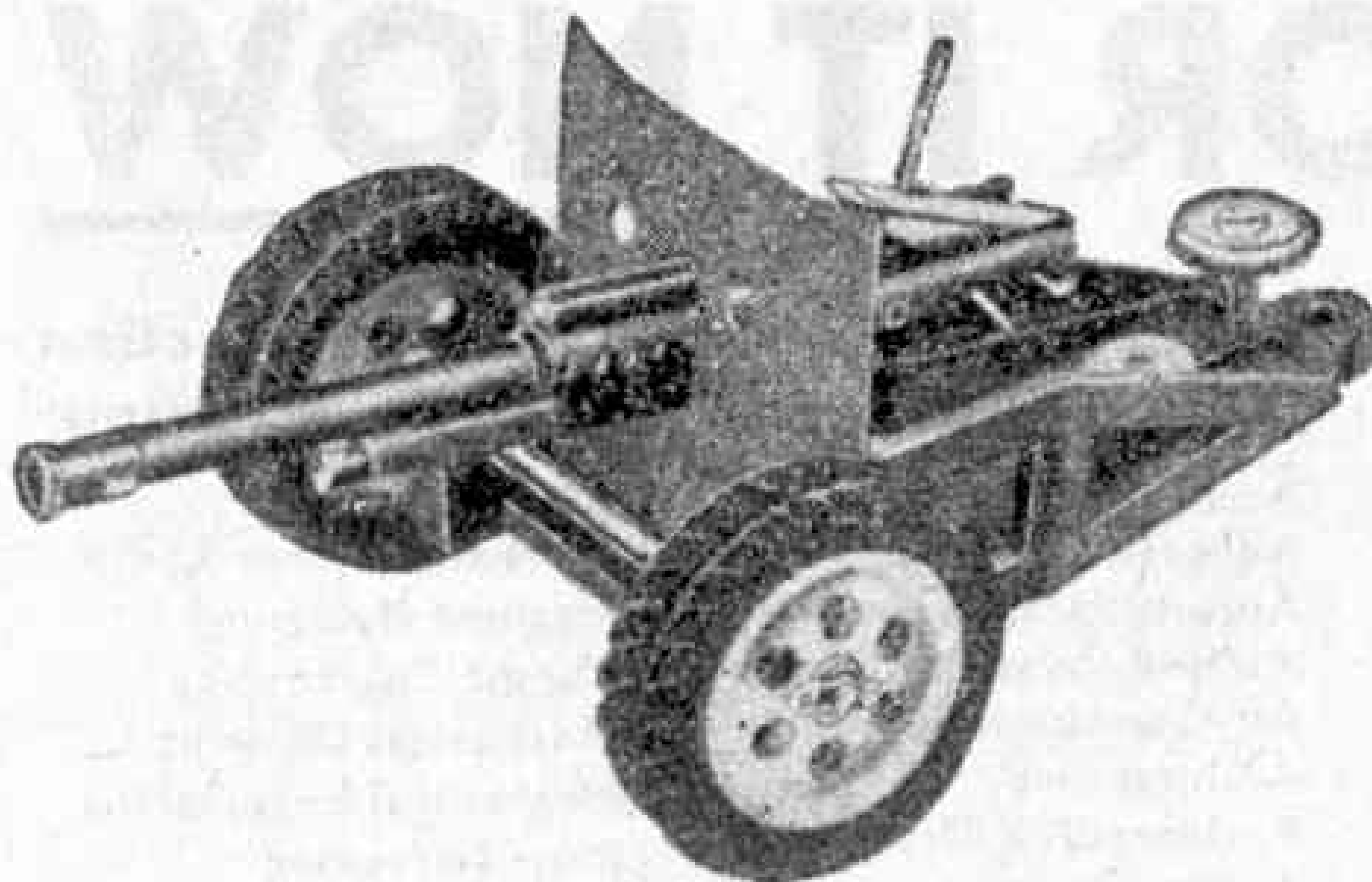
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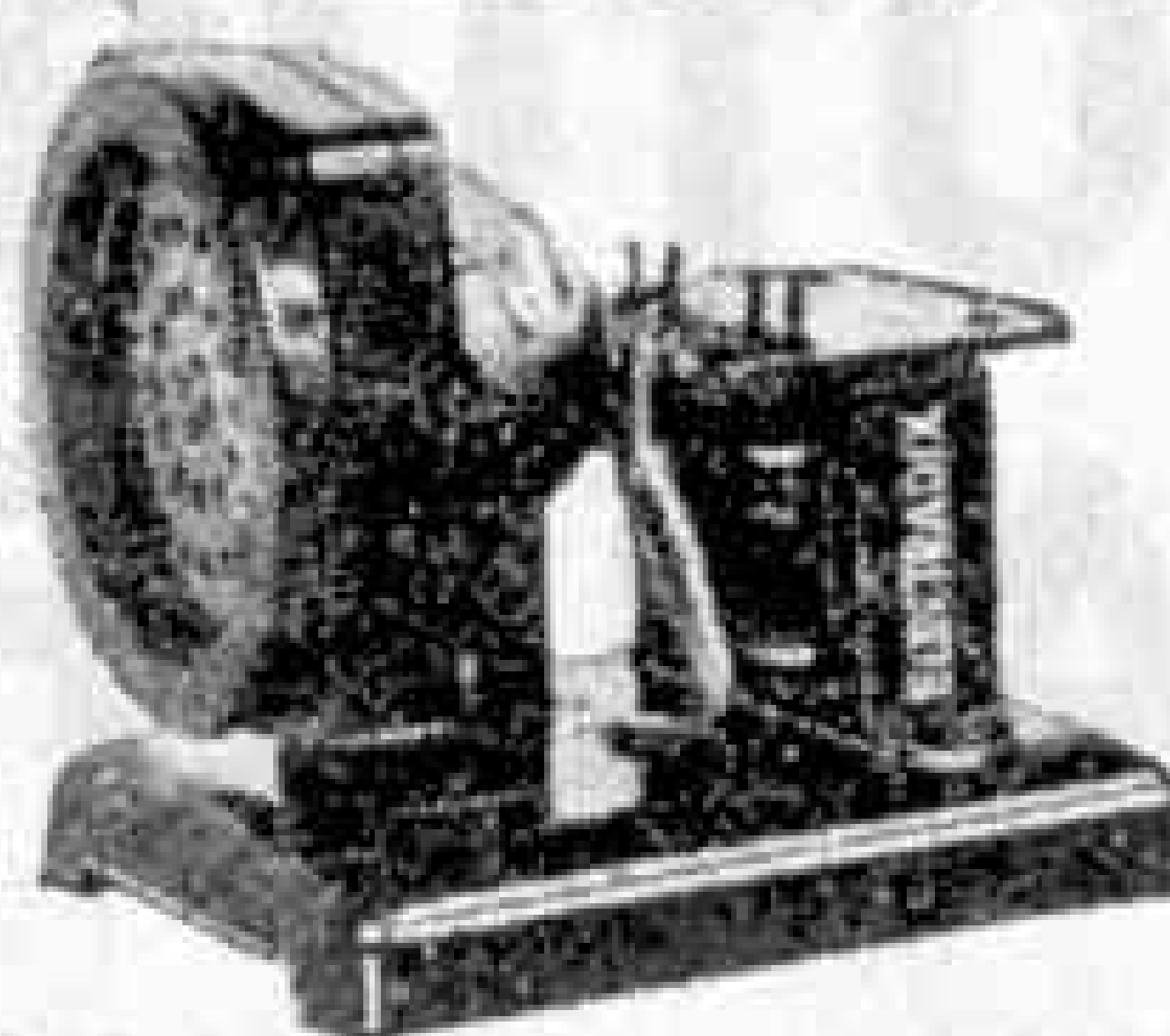
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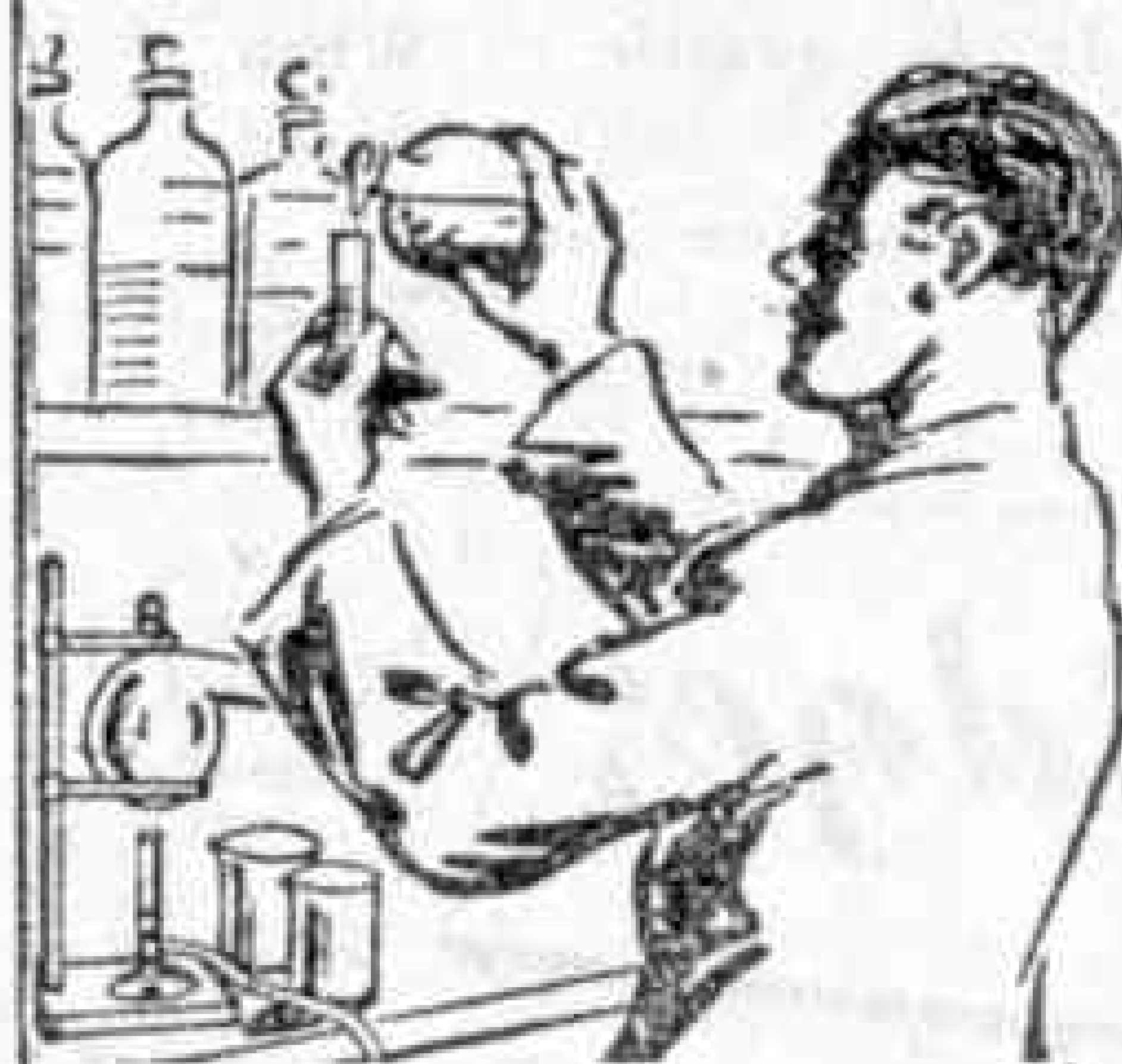
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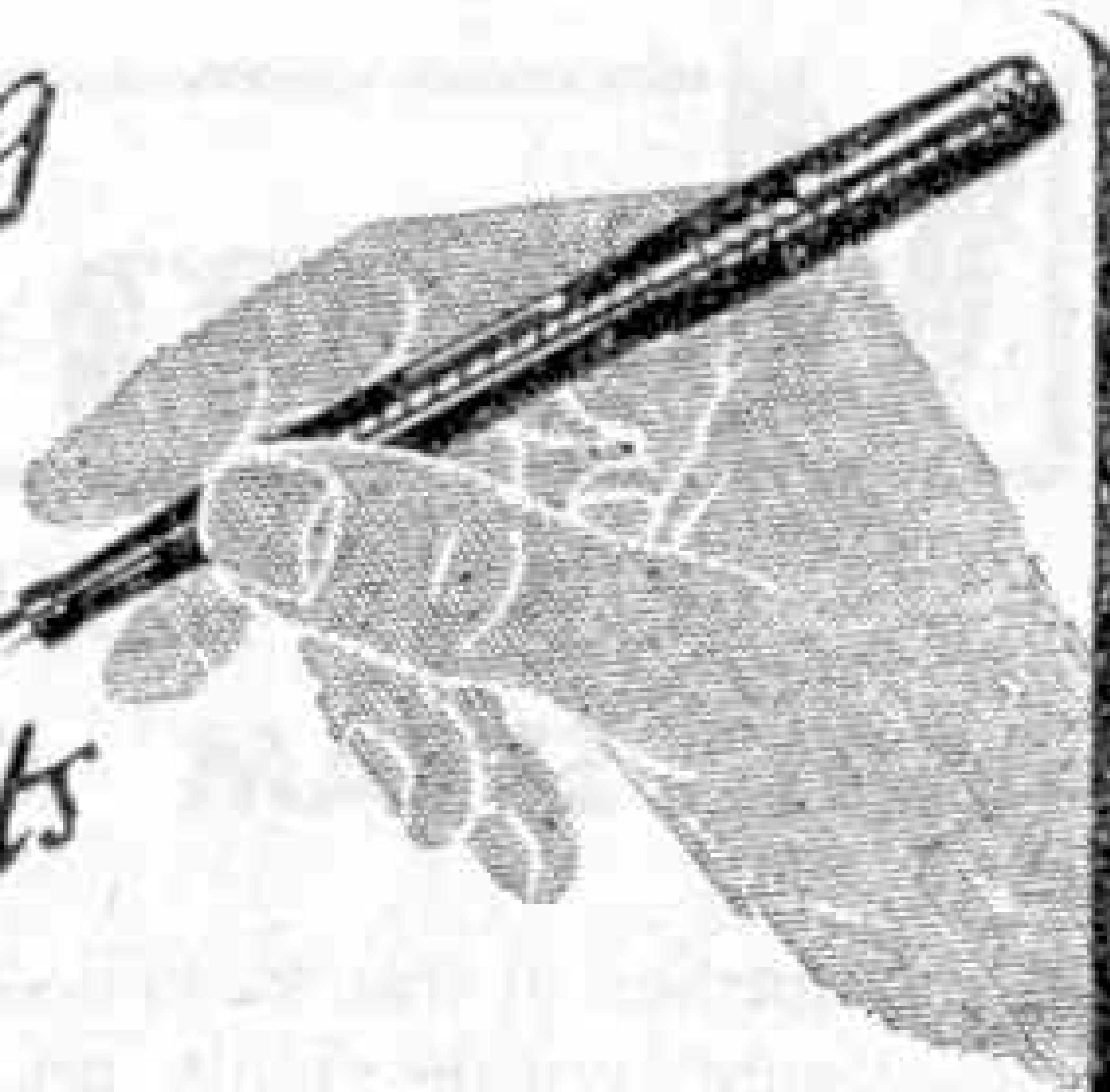


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